This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

GENERAL LIBRARY
—OF—
UNIVERSITY OF MICHIGAN.

PRESENTED BY
A. A. Crozier
Jan. 4, 1893

U. S. Bureau of foreign and domestic commerce (Dept. of commerce)

UNITED STATES CONSULAR REPORTS.

43662.

CATTLE

AND

DAIRY FARMING.

PART II.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1888.

GERMANY.

BREEDS OF CATTLE IN GERMANY.

CATTLE IN HESSE-NASSAU AND PRUSSIA.

It has been found very difficult, in the commercial city of Frankfort-on-the-Main and its neighborhood, to obtain any information and data relative to the number, races, properties, and condition of cattle in the province, of which said city is the commercial center. The country around Frankfort is thickly dotted with thriving cities and villages, and the division of landed property has proceeded to such an extent as to make farms or estates of a hundred or several hundreds of acres a rare exception. The populousness of the country, moreover, insuring a ready sale of all the finer and more delicate products of the soil, the raising of which is facilitated by a mild and equable climate, has tended to make the raising and maintenance of cattle comparatively unremunerative. Thus it is, that cattle-breeding and raising is comparatively unknown in the province of Hesse-Nassau, and that one but seldom sees such herds of cattle as abound on the extensive meadows of Northern Germany and the Netherlands.

The temperature of this city and province, although lying entirely above the 50th degree of latitude, is very moderate and equable, indeed. The mean temperature during the thirty years from 1851 to 1880 was 9.9° Celsius; in the warmest year of those thirty years it was 11.3°, and in the coldest 8.2°. The mean temperature in winter is 1.1°, in spring 9.6°, in summer 18.9°, and in fall 9.8°, all of the centigrade scale. The highest point the thermometer reached in the thirty years referred to was 36.6°, on July 21, 1865, and the lowest 21.3°, on January 7, 1861. The mean atmospheric pressure during said years was 753.4^{mm}, and varied between 750.8^{mm} (in 1853) and 757.0^{mm} (in 1854).

The province of Hesse-Nassau embraces the circuits of Cassel and Wiesbaden, and contains an area of 15,692 square kilometers, on which is maintained a population of 1,554,376 inhabitants. The following table will show the number of cattle in said province in the years 1873 and 1883, as found by the official census, viz:

Circuit of Cassel in 1873	270,001
Circuit of Cassel in 1883	272,266
Increase in 10 years	2,265
Circuit of Wiesbaden in 1873	206,367
Circuit of Wiesbaden in 1883	219,450
Increase in 10 years	13,083
Total in the province of Hesse-Nassau:	
In 1873	478,633
In 1883	489,451
Total increase in ten years	10,818

This increase in the province of Hesse-Nassau by far exceeds the average increase in the Kingdom of Prussia, which, although almost twenty-two times the size of said province, increased only 96,075, namely:

Number of cattle in the Kingdom of Prussia:	
In 1873	8,639,514
In 1883	8,735,589
Showing the above increase of	96,075

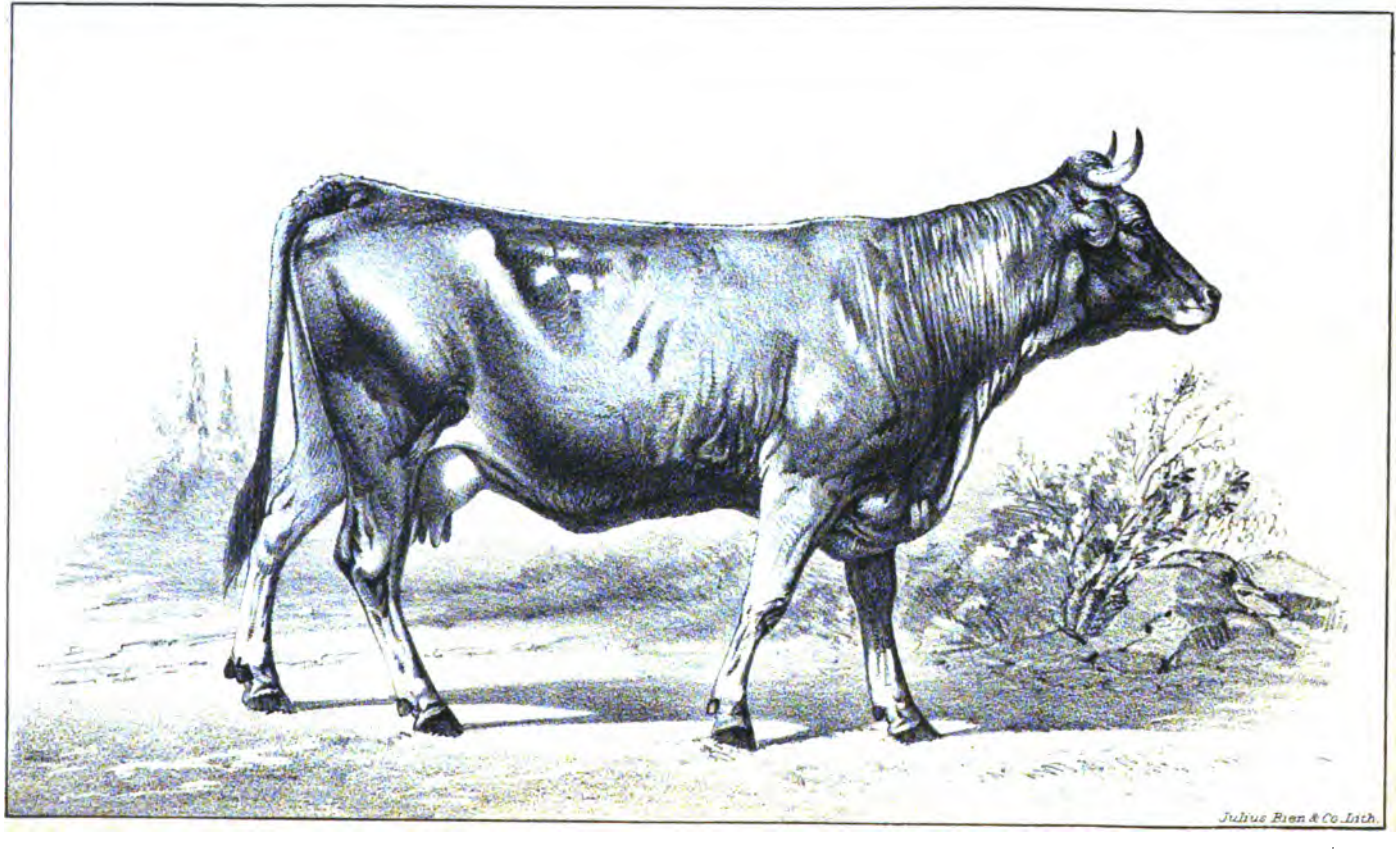
THE ORIGIN OF EUROPEAN CATTLE.

The original ancestor of the European races of cattle is called, by scientists who have investigated the subject, *Bos primigenus*, of which original race vestiges can be followed up as far as the proofs for the presence of human beings themselves go. At present this primitive form of cattle is only found in the wild Park steer of Chillingham, Scotland, although the climate has considerably reduced his form. This race, however, can only be considered as the wild typical form of European cattle, it having entirely disappeared from Europe, excepting the reduced race of Scotland referred to. The two great groups of cattle which have inherited the type of the *Bos primigenus* are:

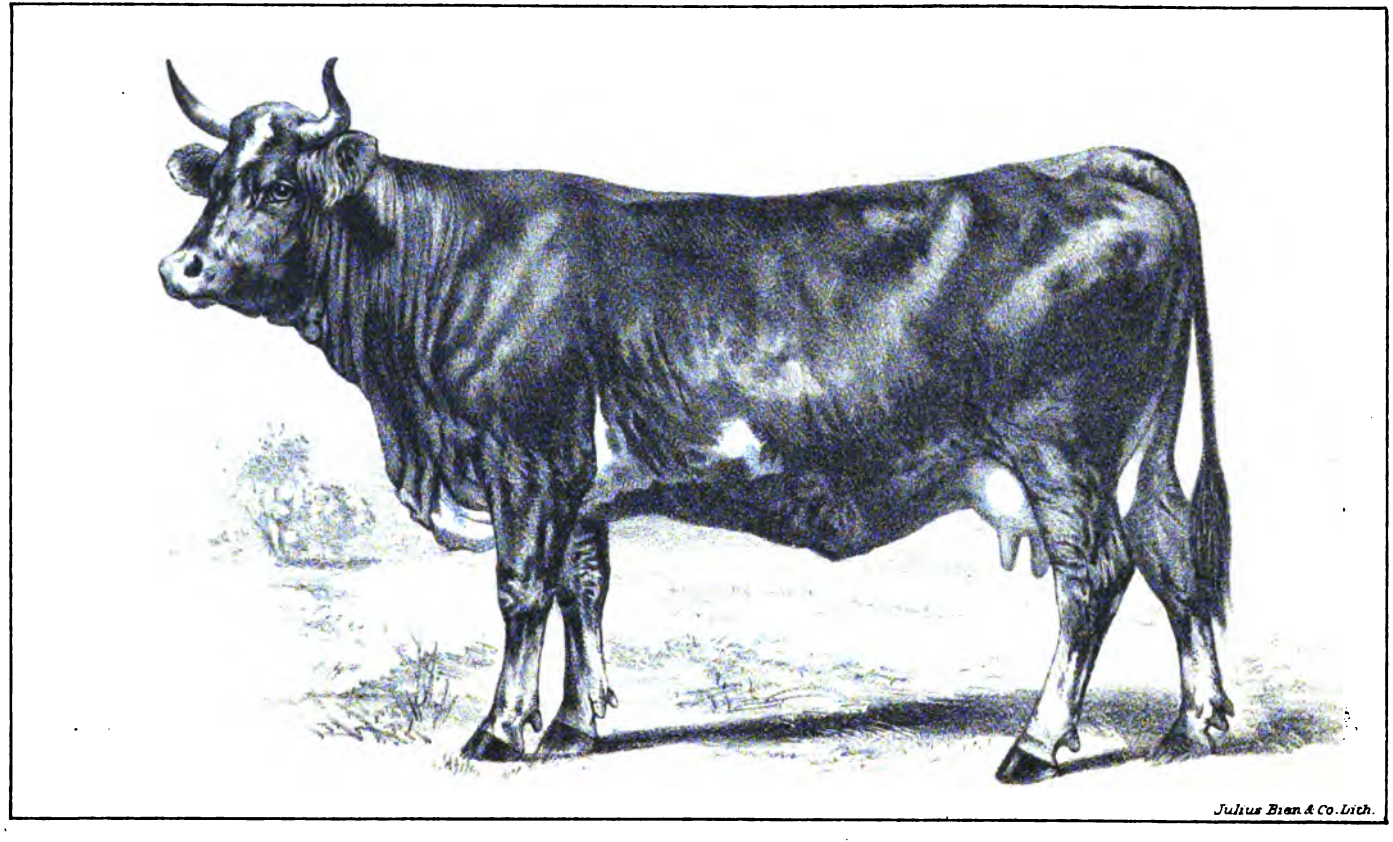
(1) The lowland cattle of Northwestern and Western Europe, notably in Holland, Freisland, on the Lower Elbe, in the plains of Dantzig, in Flanders, in the Ardennes, in Picardy, Normandy, and Bretagne, and in the eastern countries of England (Shorthorns).

(2) The steppe-cattle of Southeastern and Eastern, Western and Northern Europe, the Romanic race in Italy, the cattle of Scotland and Wales.

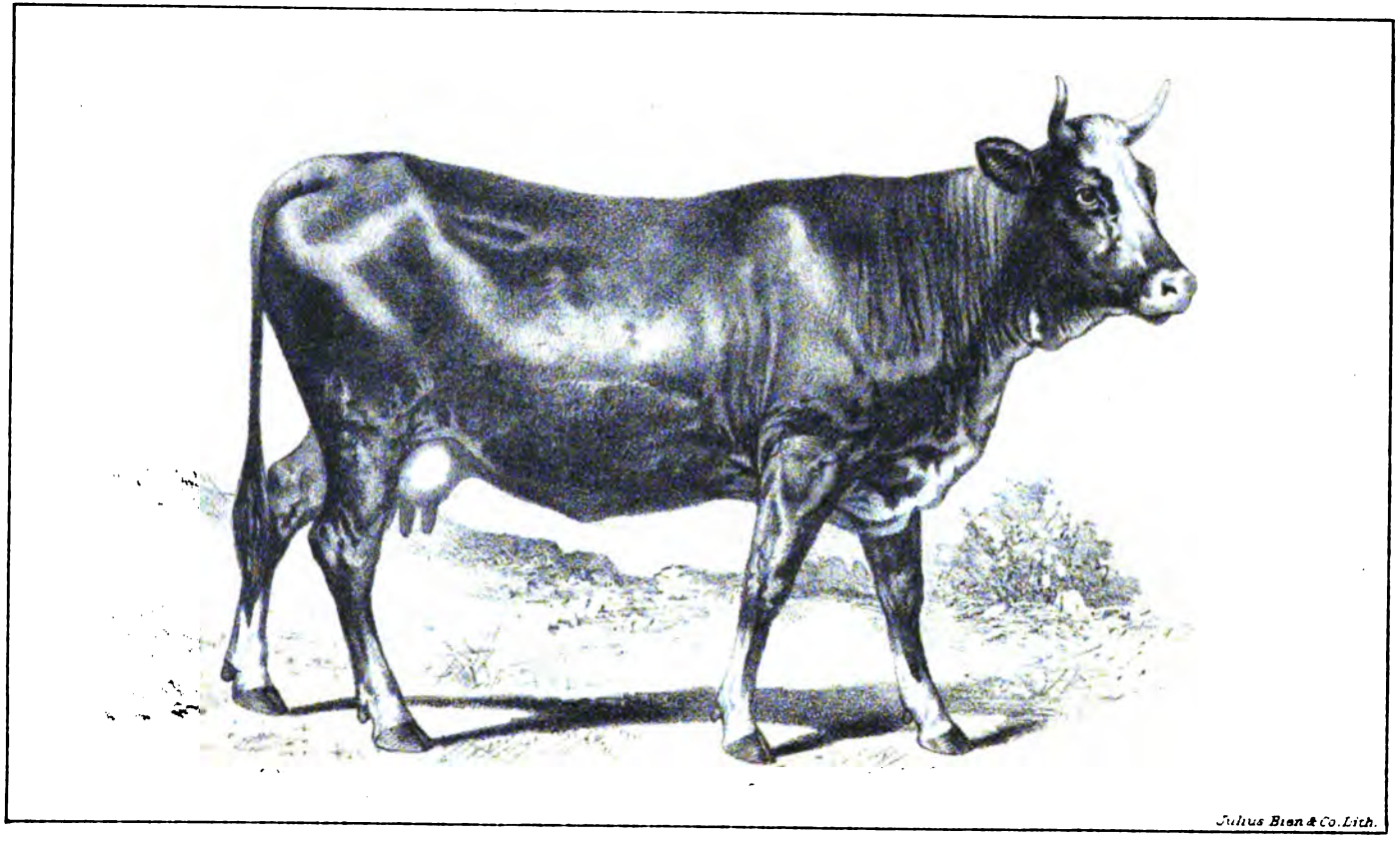
Next to the race of *Bos primigenus*, and as a branch and modification thereof, the race called *Bos frontosus* was discovered, from which are descended the variegated cattle of Switzerland (Berner, Simmenthaler, Saanenthaler, and Freiburger), the similarly-typed races of the Tyrol and Salzburg (Zillerthaler, Duxthaler, Pinzgauer, &c.), the Miesbacher type of Upper Bavaria; the Egerland and Voigtland cattle of Bohemia and Saxony, and probably, also, the hornless cattle of England, Scotland, and Norway, and the cattle of Westmoreland, Cumberland, Lancashire, and Devonshire. From another branch of the original *Bos primigenus*, the *Bos brachiceros*, are descended the gray-brown and lighter or darker gray cattle of Switzerland (Schwytzer, Graubindener, Montafoner, Obernimthaler, Murzthaler, Pusterwalder, and Allgauer); also most of the types of the Pyrenees and the neighboring departments (Landes, Gascogne, Garonne), as well as the dwarfed cow of Shetland. Of course the many crossings between these original races and their descendants have produced numerous intermediate breeds, notably in Middle and Southern Germany, in Austria, in Middle and Eastern France, and in England, which it is impossible now to trace with certainty to either of the great original races mentioned. It will appear from the foregoing statements that a description of the different types or races of cattle of Middle Europe might be attempted, from various different points of view, according to the predilection of the party describing them. One might choose the geographical standpoint describing simply the cattle now existing in the different countries or regions, without reference to affinity or descent; another would describe the groups and races of cattle, which, although not contiguous geographically, would seem to him to have descended from the same original type, while still another would make color the distinguishing feature of this classification. But all these divisions are subject to certain objections, and it re-



LIMBURGER RACE



SIMMENTHALER RACE



NECKAR RACE

mains, therefore, only to take the different types as we now find them and describe them without any attempt at classification.

I.—The Neckar Race.

This is the leading type of cattle in the Kingdom of Wurtemberg. It is of red color, of large and rather heavy body and deep belly. Other points of description may be gathered from the annexed cut. The live weight of a cow is from 1,100 to 1,300 pounds. This race exceeds the Simmenthaler in the amount of milk furnished, is equally well adapted for the butcher, but inferior as draft-animals. When fattened they reach a weight of nearly 2,000 pounds. The calves are unusually large and heavy when born.

II.—The Simmenthaler Race.

This race is indigenious in the valley of the Simme, Switzerland, and is the race mainly used in Southern Germany to improve the German cattle. Its leading features are: Head small and light, with gentle yet lively expression; horns fine and good, pointed forward and upward; neck short; body well rounded in the ribs; rump broad and long; tail usually sitting high; color generally red, but often variegated; weight averages 1,500 pounds for cows and from 2,400 to 2,600 pounds for bulls. Observations concerning the increase of weight made at Hohenheim, in the Simmen Valley, gave the following results: Animals of one-fourth to one year were fed daily 19 pounds of hay-value, while their average weight was 475 pounds. Heifers, in their second year, received 22 pounds daily, their average weight being 700 pounds. Cows, big with calf, in their third year, averaging in weight 1,000 pounds, were given in feed 28 pounds hay-value per day. The increase of weight was as follows for each 100 pounds of hay-value consumed: With animals of one-fourth to one year, 7.94 pounds; with animals of one to two years, 6.12 pounds; with animals of two to three years, 3.82 pounds. Observations continued during a whole year of rational feeding and its results made with this kind of cattle showed the following results, viz: Quantity of food consumed 17,193 pounds of hay-value, or 47.2 pounds daily, or, taking an average weight of 1,500 pounds, 3.14 pounds for each 100 pounds of body weight.

(It may be proper to state at this point that the expression "hay-value," used in the foregoing statement, means the nutritive properties of the different kinds of feed reduced to the nutritive value of hay.)

The cows so fed yielded an average quantity of 1,823½ quarts (of 4 pounds each) of milk and one calf of an average weight of 96 pounds.

The fattening of this cattle is accomplished with hay and salt alone, the hay in that country being far richer than that of the prairies. The principal markets for fat cattle are Saanen, Chateau d'Oeux, and Rougemont.

III.—The Limbourg Race.

This type is found in the Belgian province of Limbourg and in a part of Wurtemberg, notably in the districts of Gaildorf, Aalen, Gmund, and in the valleys of the Roth and Leine. The color of this type is silvery-yellow, with now and then a white spot on the forehead. The hide is very fine and pliable, making usually numerous folds on the neck, running from the well-developed dew-lap to the top. The head is long, narrow, and often shows a curved profile. The horns are fine, round,

and generally turned forward and upward. The chest is not well developed; the body small; average weight of cows 650 to 800 pounds; oxen reach 1,600 to 1,700 pounds. They are good milk givers, yielding per year about 1,800 liters of milk, of which 10 pounds will make 1½ pounds of butter.

IV.—The Friesdorf Race.

The original home of this race is Middle Franconia, in Bavaria, notably the districts of Ansbach, Leutershausen, Feuchtwangen, Dinkelsbuhl, Wassertrudingen, Gunzenhausen, and Herrieden. The race has become, on account of its good points, one of the most favored of Germany. They excel as draft and butcher animals. The head is strong and long; chest broad and deep; back straight. The legs are high, yet strong. The color is peculiar, being mainly a yellow-red, variegated after the manner of the tiger. Of course, there are exceptions, such as black and brown variegations; but such specimens are not considered desirable. The live weight of cows is 1,000 to 1,100 pounds, of oxen 1,300 to 1,800. Average cows yield 1,300 liters of milk per year; large ones, weighing between 1,100 and 1,250 pounds, 2,000 liters. Sixteen liters of milk yield a pound of butter. The calves are unusually large. The principal market for draft oxen of this type is Ansbach.

V.—The Alb Race.

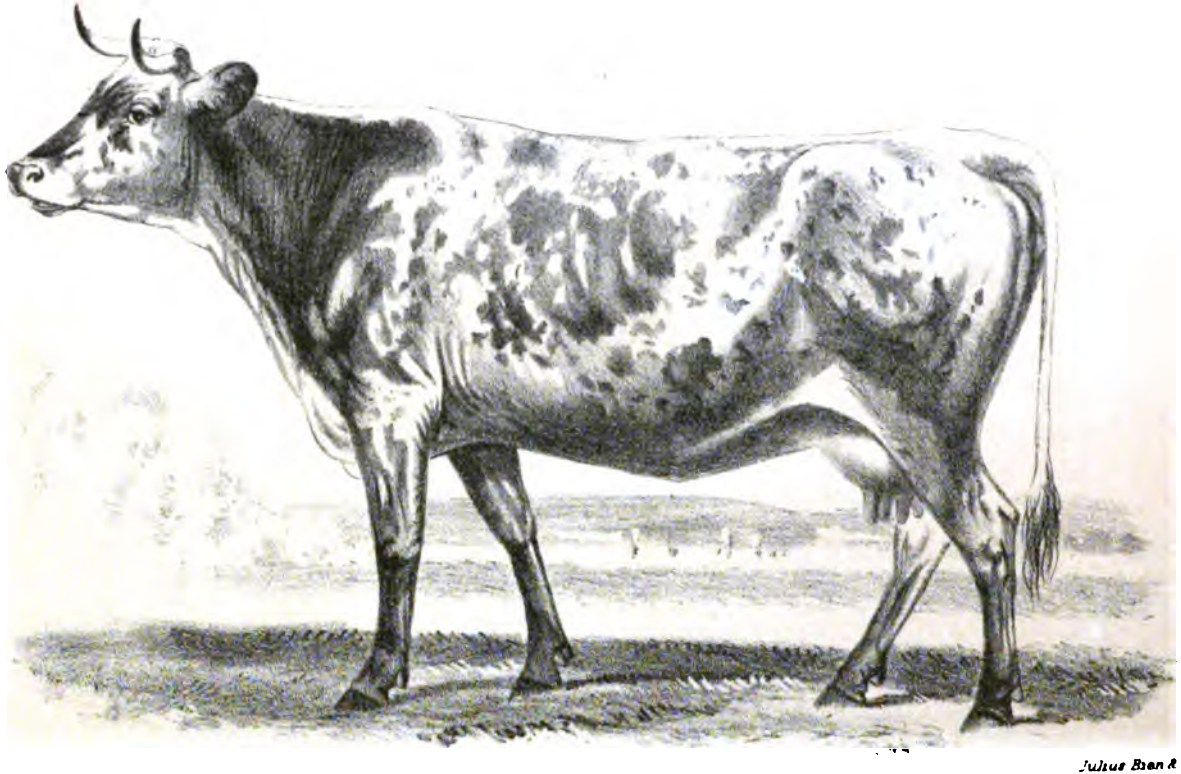
This is one of the best milk-giving races of Germany. It is pre-eminently the cow of the small farmer of Southern Germany, who looks to the cow not only for the milk to supply his house demand, but who also puts her to the plow and wagon. It is a small type, scarcely ever exceeding 800 pounds in weight and falling often below 550 pounds. They thrive on scanty feed. Their color is yellowish-red. The calves are usually very small. This race is now being improved by crossing it with the Simmenthaler race.

VI.—The Schwab Hall Race.

This race is so called because for many decades it has been mainly bred in the region of Schwäbisch Hall. They are a rather heavy dark-red to chestnut-brown race, showing more or less white only about the head. The cows weigh from 850 to 1,000 pounds, and the oxen from 1,750 to 1,900 pounds. The latter, on account of the strength and regularity of their limbs, are much sought as draft-animals, the more because they are easily fattened, when no longer fit for draft purposes, and furnish excellent meat.

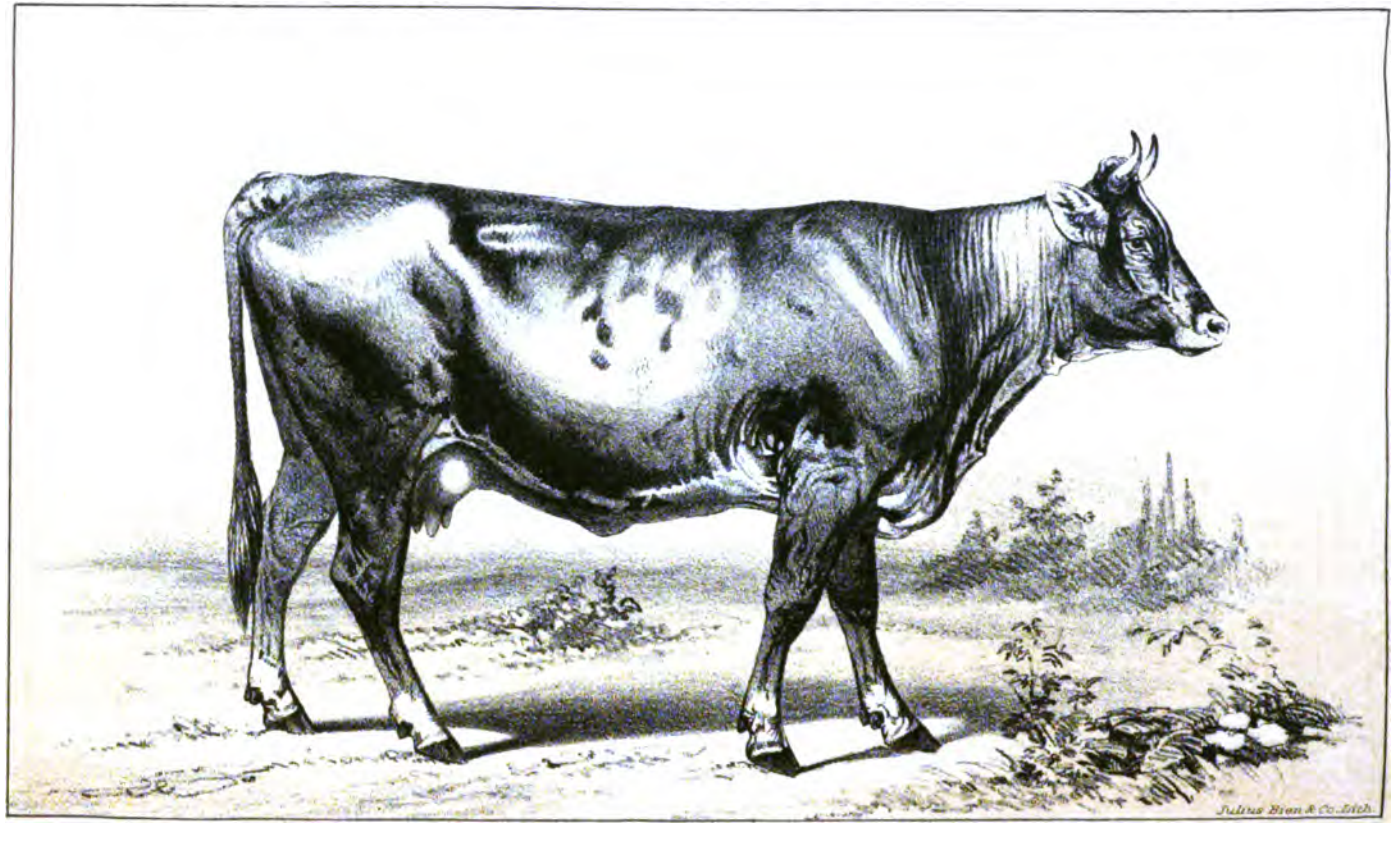
VII.—The Dutch Race.

This race is the leading representative of the lowland races, and is mainly sought in the neighborhood of large cities, where the sale of fresh milk is profitable. It can be found, however, in all parts of Northern Germany, where feed is abundant. The finest and heaviest specimens of this type are bred in the neighborhood of Leyden. The head of the Holland cattle is long, narrow, and light, with broad mouth and horns always pointing forward, their black tips being usually turned upward. The long neck, with but indifferently developed dew-lap, frequently shows a slight depression on the ridge. Chest and back are broad, and

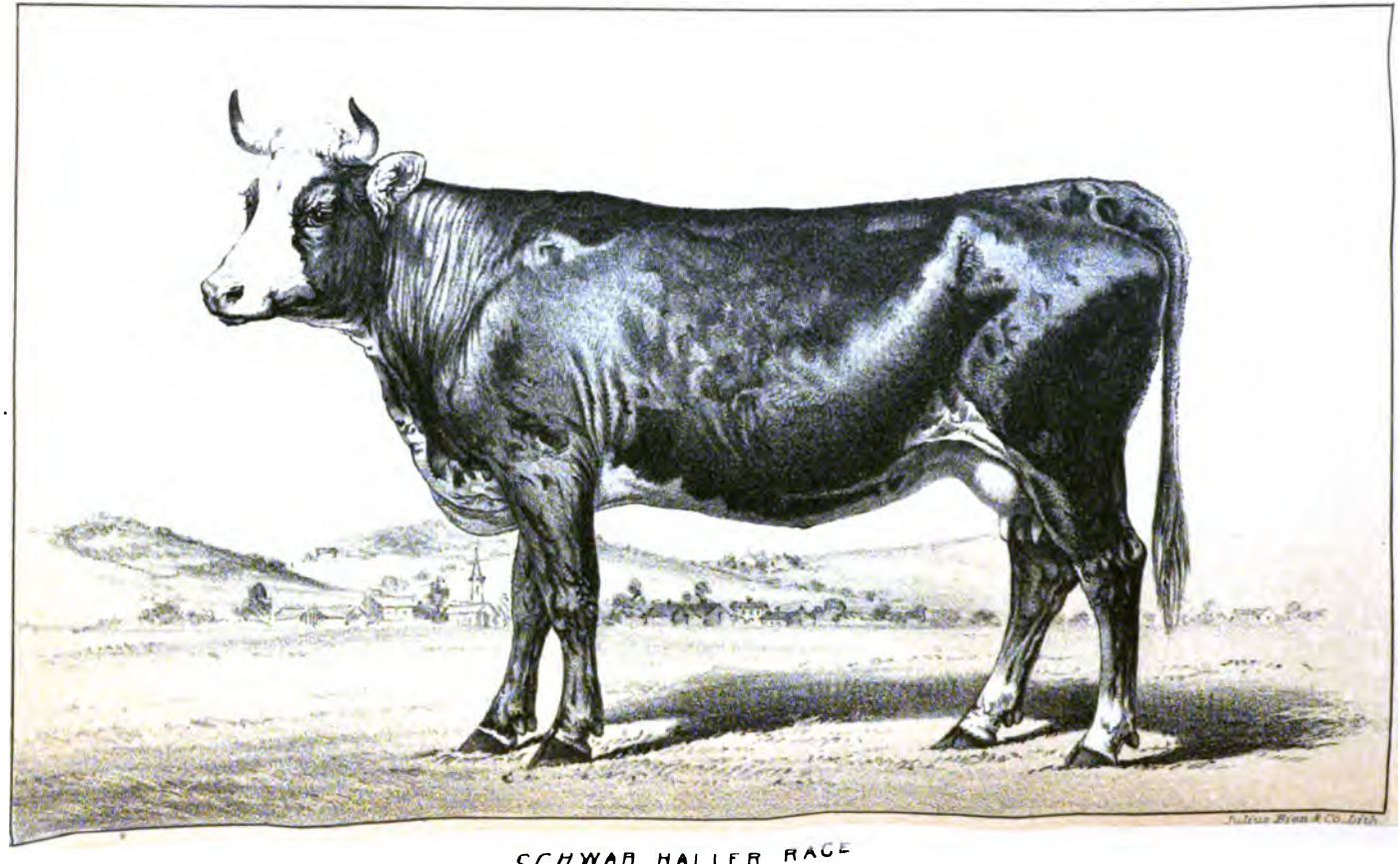


TRIESDORFER RACE

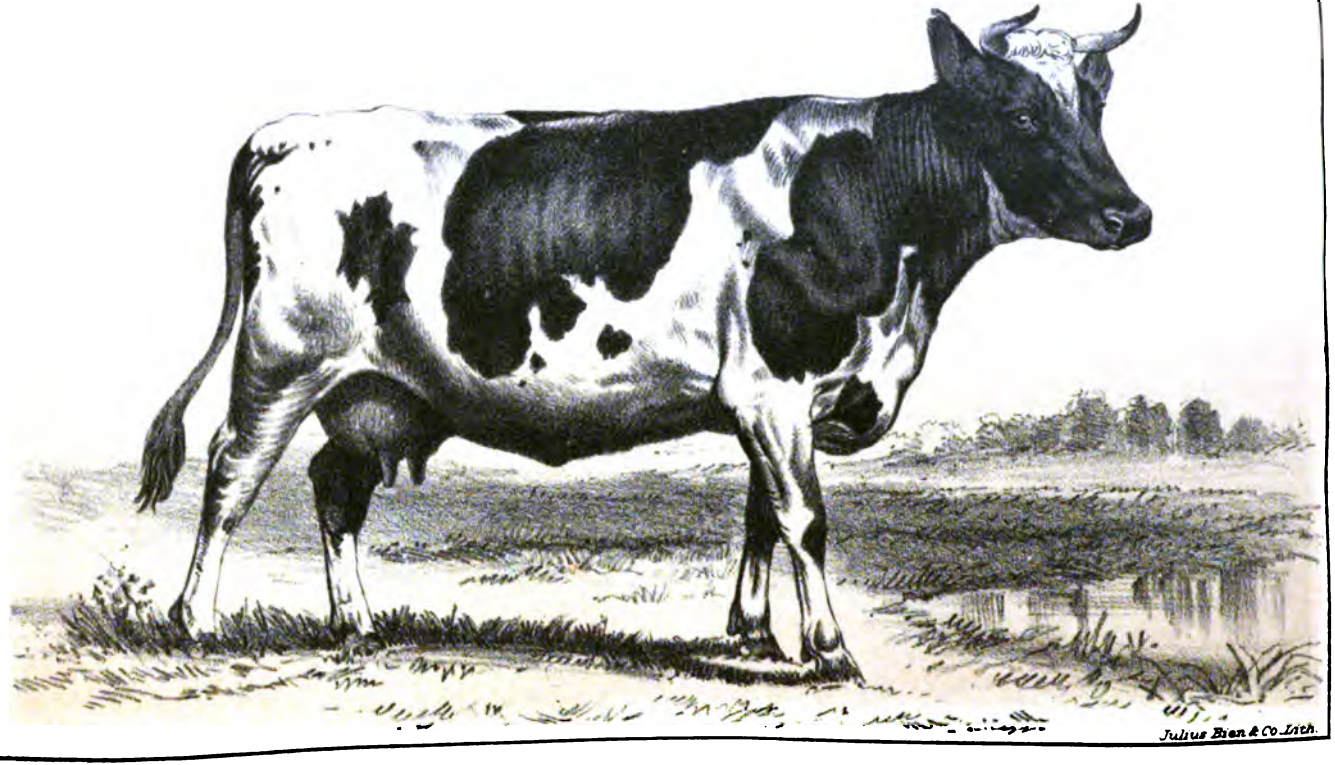
PLATE 178



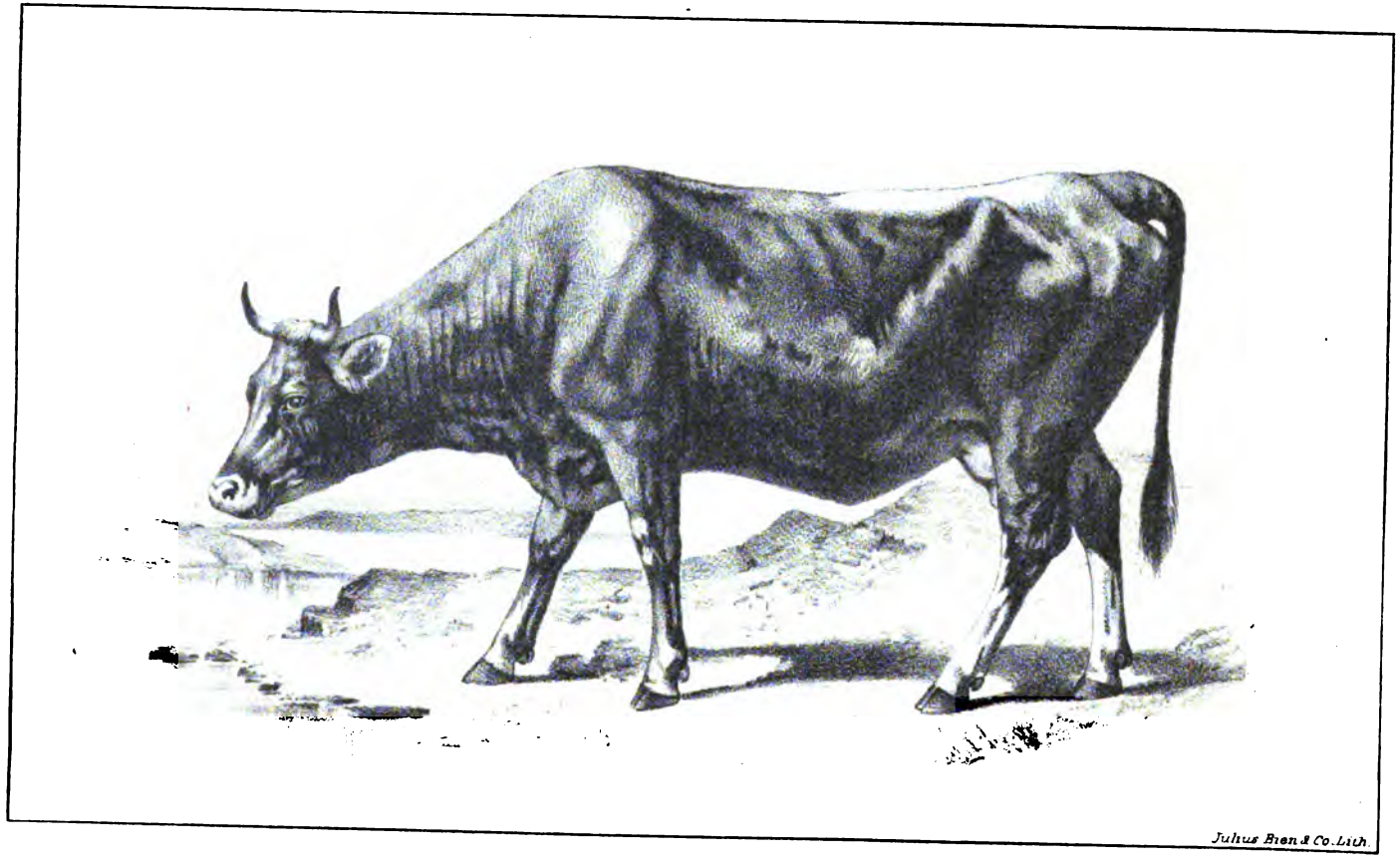
ALB RACE



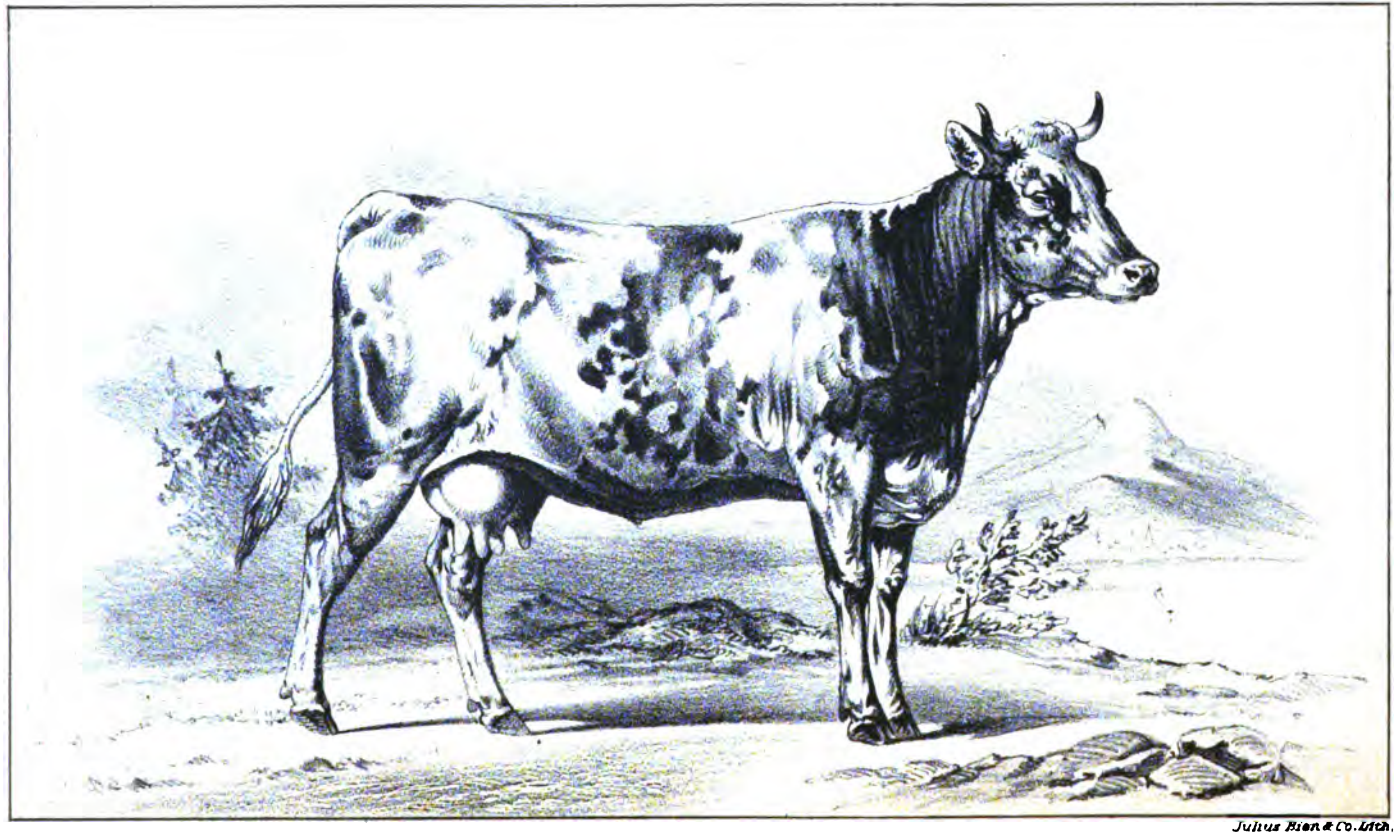
SCHWYZ HALLER RACE



HOLLANDER RACE

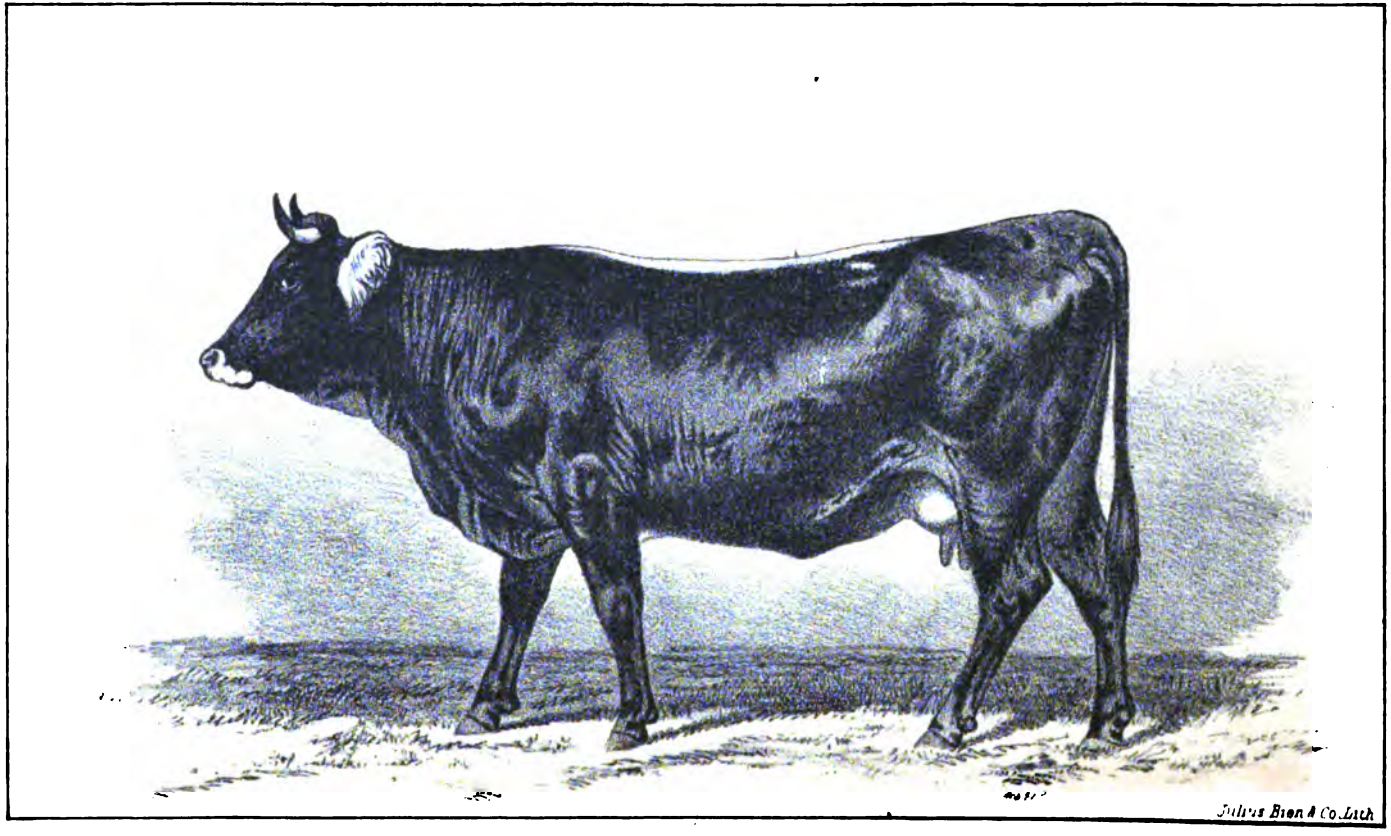


PINZGAUER RACE



Julius Bien & Co. Lith.

MIESBACHER RACE



MONTAFUNER RACE

the line of the back, with rare exceptions, straight to the tail. The body is long, limbs flat and high, hind legs of cows often inclining to be knock-kneed. The most profitable of this kind of cattle are bought in Friesland (in the north of Holland); these are very heavy, with fine bones, delicate skin, and in color mostly white with black, gray-blue, gray, or even dark-brown spots. Their live weight averages 1,300 pounds. It has been ascertained that the efforts to increase the size and beauty of this cattle, which have been quite successful, have resulted in diminishing their milk-giving properties, so that a decrease of 150 liters per year, as compared with former estimates, has been established. The average amount of milk now is about 2,700 liters per year, the cows yielding about 27 liters per hundredweight of hay-value, these 27 liters making about 2 pounds of butter. The cows require plenty of feed, but remain lean while giving milk; when permitted to "stand dry," that is, when no longer milked, they fatten quickly. By reason of their weight they make good draft-animals, but much depends in each case upon the formation of the skeleton, especially the position of the legs.

VIII.—The Montafoner Race.

This is a branch of the Schwytzer race. It does not belong to the heavy races as the former, but is of medium weight. Cows average about 1,100 pounds. The color is mostly black, to black-brown, with gray mouth, a gray stripe along the back, and light hair in the ears. The head is small, forehead broad, horns white at the base, otherwise black. The neck is short, dew-lap much developed, chest broad. The back inclines to making a slight downward curve (sway-back). The udder is large. The quantity of milk yielded by good cows amounts frequently to 1,900 liters. The milk is of good quality, 100 liters giving 10 pounds of butter and 17 pounds of cheese. The oxen feed well, grow very heavy, make good draft-animals, and are easily fattened; the meat, however, is coarse-grained. The home of this race is the valley of Montafone, from Bludenz to Schluns, near the Lake of Constance, the latter place being the principal market.

Although the Montafoner cattle are naturally a pasture-cattle, yet they thrive very well in stables, and hence have spread over a large part of Germany.

IX.—The Miesbacher Race.

This race is a combination of the Pinzgauer and Fruitiger races, and has its home in the Bavarian mountains in the neighborhood of Miesbach, Holzkirchen, and Tolz. It is a small race, cows averaging only 750 to 850 pounds, but the form is that of finely shaped mountain cattle; color usually white with yellow or red spots. The yield of milk reaches 2,100 liters per year.

X.—The Pinzgauer Race.

From their original home in Austrian Salzkammergut this race has spread into the adjoining regions of the Tyrol and Upper Austria as far as Wels. They are also found in the neighborhood of Ems and Saint Florian and in the Bavarian mountains. The principal markets for them in Salzkammergut are: Salzburg, Althennig, Oberndorf, Oberalm, Mana-Plain, Saint Leonhard, and Saalfelden; in the Pinzgau: Mittersill and Zell-on-the-Lake; in the Pongau: Saint Johann and Nerfen; in the

Lungau: Mauterndorf. Outside of the province of Salzburg important markets are: Zimmelkarn in Upper Austria, Kufstein in the Tyrol, and Tittmaning in Upper Bavaria.

The animals are mostly red to red-brown, with a white stripe commencing between the shoulders, widening between the rump bones and then narrowing again at the tail. Sometimes this white field extends over the loins and hind legs. The skin is fine and elastic. The head is short, broad between the eyes; horns finely shaped, pointing outward and upward, white with black tips. The neck is thin, with well formed dew-lap; body long, frequently higher at the shoulders than behind; position and movement of limbs correct. They are a fine mountain race, showing all the points of good milkers. They make good draft-animals, and fatten quickly, yielding a superior quality of meat. The cows weigh about 850 pounds, and the annual yield of milk is estimated at 1,600 liters, of which 13 make a pound of butter.

XI.—The Allgauer Race.

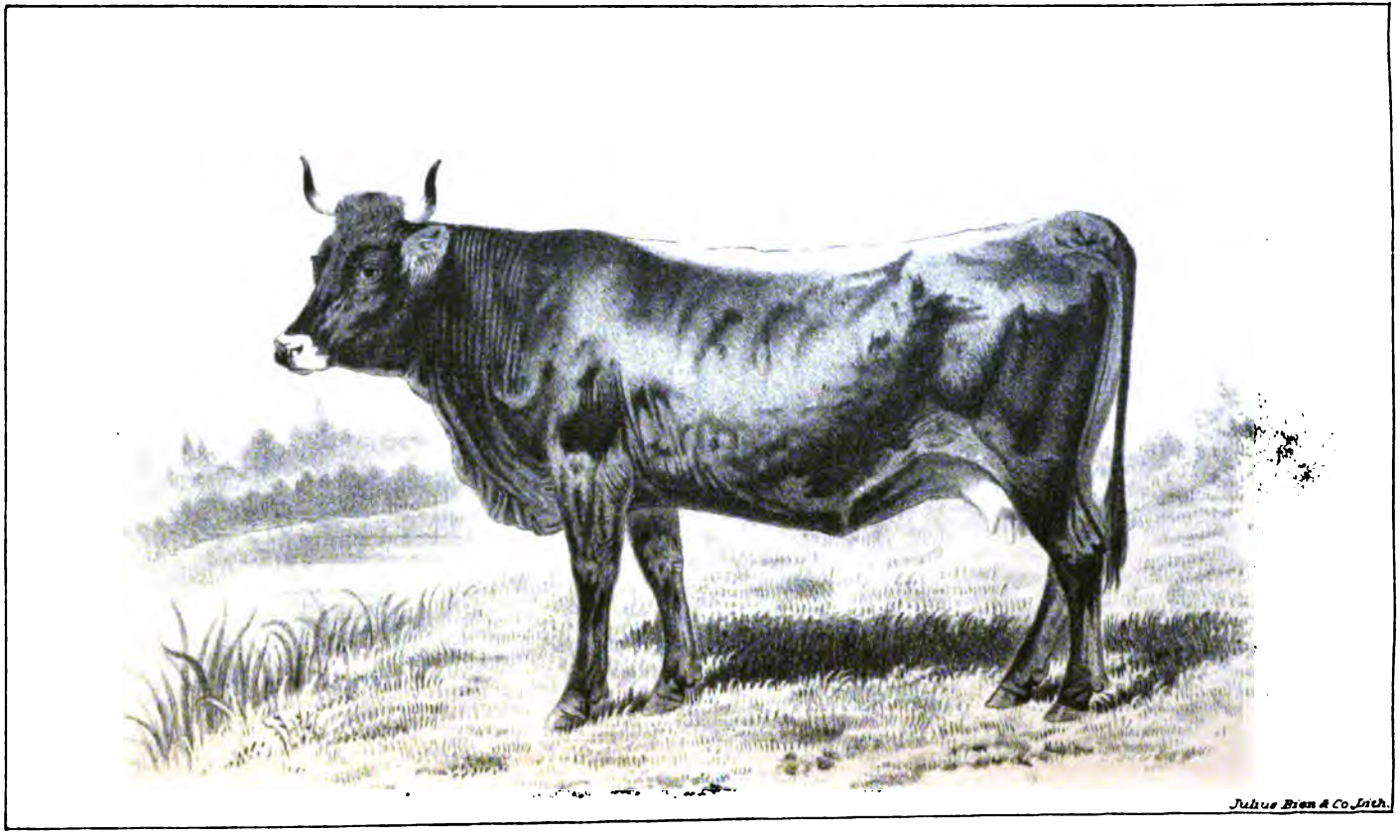
Originally bred in the Alpine regions of Sonthofen, Immenstadt and Füssten, this race has, by reason of its adaptability to all the purposes of the small farmer, its ability to live and thrive on scanty food, and its long-preserved usefulness, spread over a large extent of country, and is now being imported very largely into Saxony, Baden, Prussia, Bohemia, and even Poland and Hungary. Although the smallest of the brown-gray races, it is yet of middle size. The cows weigh 850 to 1,000 pounds. The color is gray or yellow-brown, always showing the black doe-mouth and a darker shade along the loins and neck. The skeleton is much finer than that of the Montafoner and Rigi races. The head is small and finely shaped, neck short, with well-developed dew-lap, horns white at the base and getting darker towards the points, which are black; body finely shaped and well knit. The chest, as with all good milk givers, is not very wide, but the smaller ribs are wide, the belly broad and deep. The oxen become remarkably heavy as compared with the cows and bulls. Cows of 750 to 900 pounds, consuming a quantity of feed equal to about 25 pounds of hay-value, yield 1,980 liters of milk per year, of which 10 liters make a pound of butter. Experiments made in Saxony have shown that a consumption of 100 pounds of hay-value produced with the Allgauer race 29.38 liters of milk which made 2.32 pounds of butter, while the Holland race yielded 25.26 liters, which made 1.76 pounds of butter, and the ordinary land-cows of Saxony 23.16 liters of milk, and 1.78 pounds of butter. The Allgauer race therefore excels over the other races named in quantity as well as in quality of milk. The meat, however, has the marked characteristics of that of almost all mountain cattle; it is coarse, dry, and tough. The leading markets for Allgauer cattle are Southofen, Stauffen, and Immenstadt. The season for the purchase of animals is the middle of October, at which time the herdsmen return with their herds from the Alps to the valley. The annexed cut shows a modern stable with hollow iron columns, cement cribs, running water, and good ventilation.

XII.—The Schwytzer Race.

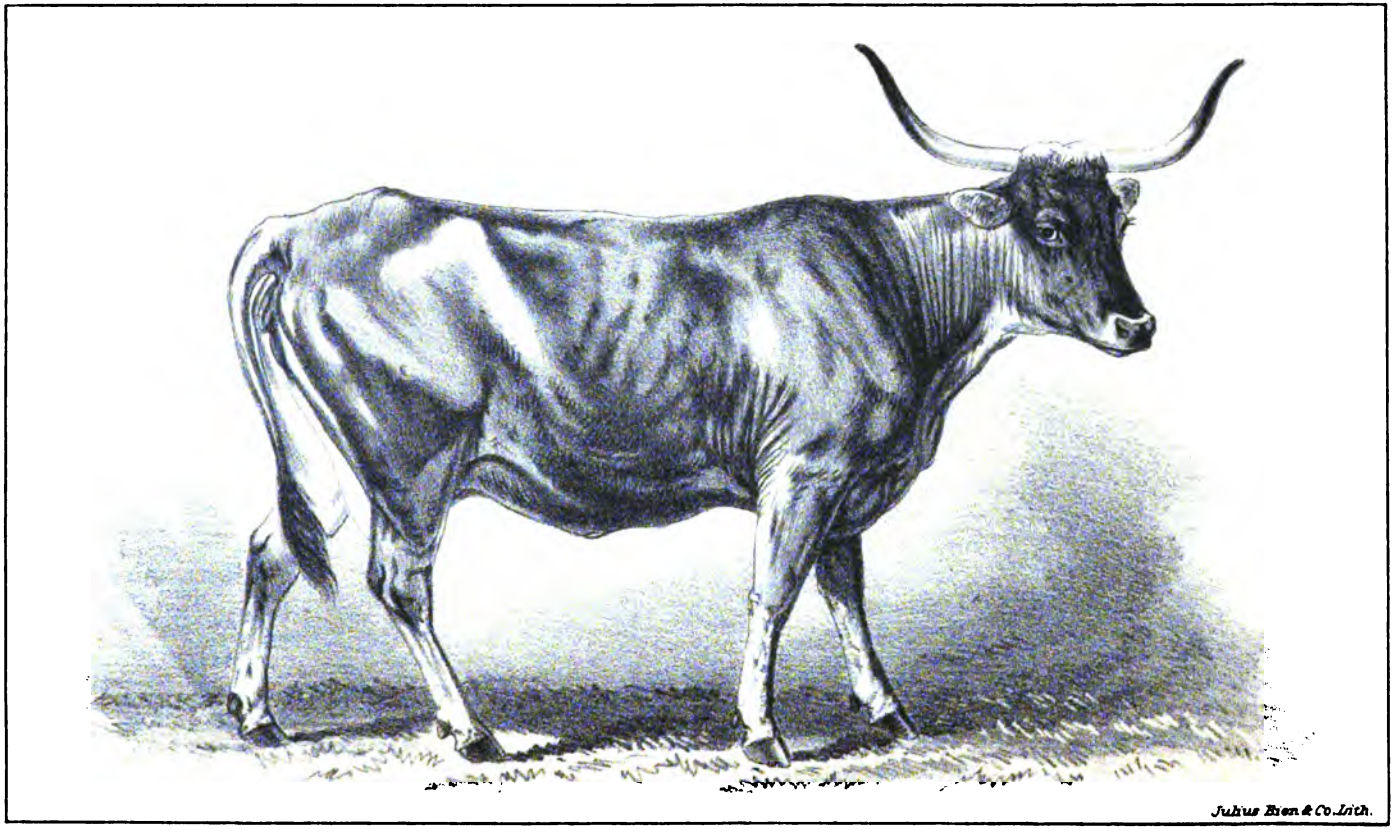
This race derives its name from the Swiss canton of Schwytz; it is sometimes also called the "Rigi race," after the well-known mountain on the border of said canton. It is now bred, however, not only in said canton, but also in the cantons of St. Galle, Unterwalden, Zurich,

Julius Bien & Co. Lith

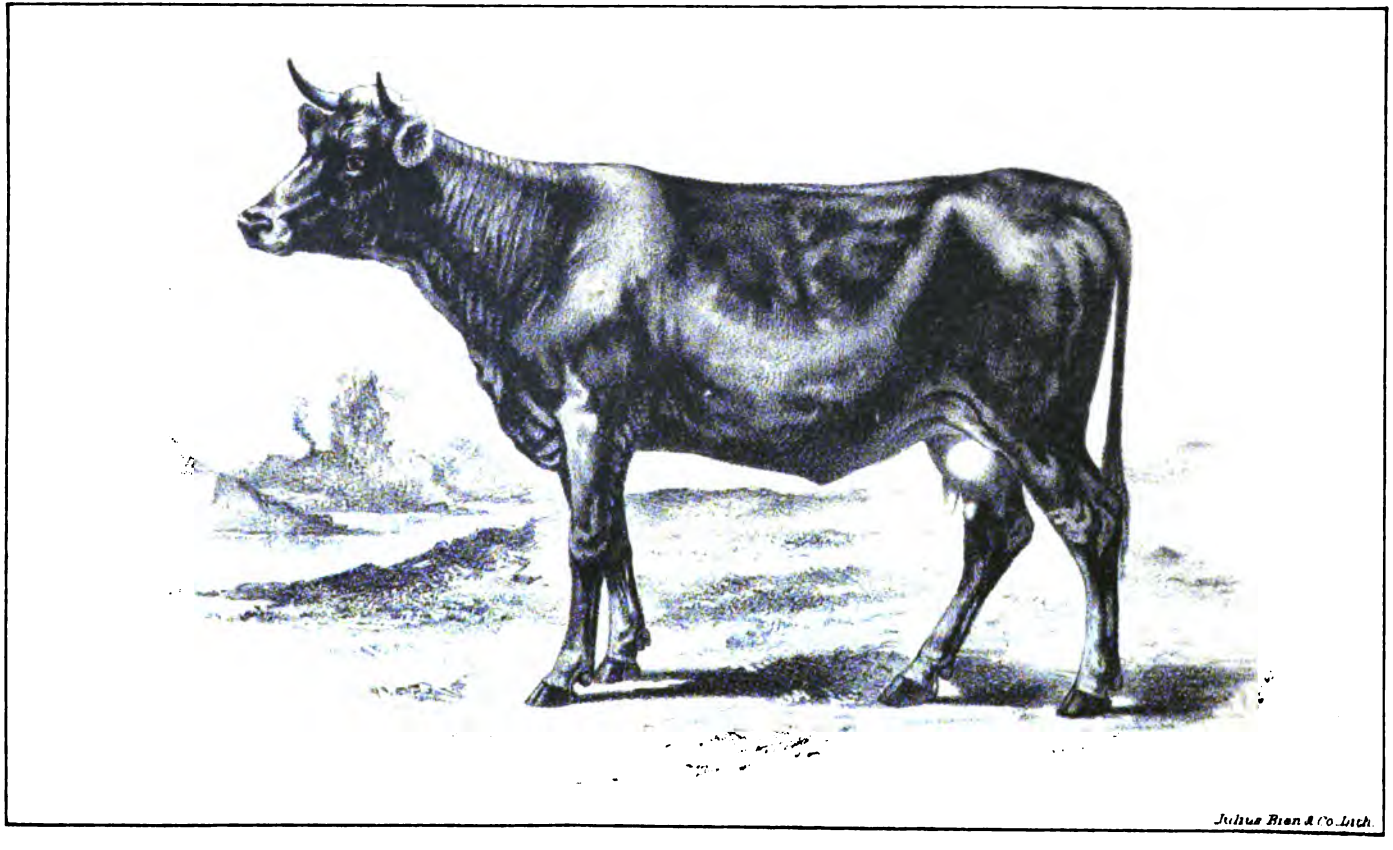
ALGAUER RACE



SCHWYZER RACE



PODOLISCHE RACE



ANGELN RACE

Luzern, and Uri. This race, like the Allgauer, is much resorted to to improve the cattle of Bavaria and Wurtemberg. The crossing of the Allgauer and the Schwytzer stock, too, is much practiced to produce a still heavier and more milk-yielding race.

The Schwytzer race is the heaviest and most valuable of the brown-gray races, the cows reaching a weight of 1,400 to 1,650 pounds, and the bulls often weighing more than 2,600 pounds. The bones are massive and heavy, head heavy and broad, mouth large, horns not very fine, of light color, with black tips, ears very large with a yellowish bush of hair protruding from them. The color of the animals ranges from a dark brown to a light gray, with no variation except that the color lightens along the back and at the feet and mouth. The hair is fine, shining, and smooth, the skin soft, but not thin. The neck is strong but not short, dew-lap very large, chest deep, back straight and long. With proper feeding, the cows of this race are the best milk givers of all the mountain races, the milk, moreover, being very rich. The oxen become very heavy, are excellent draft-animals, and fatten easily. The calves of this race are the heaviest of all the mountain races. It is claimed by some that it is difficult to acclimate the race, which, if true, may be because it is difficult to find in other countries pastures so rich and abundant as those of their native cantons.

XIII.—The Voightlander Race.*

This type of cattle is found in Saxony, Anhalt, in parts of Bavaria, and Bohemia. A race of less than medium size, they do not excel in anything except a certain hardiness, which enables them to thrive on scanty feed and still to furnish somewhere from 1,200 to 1,400 liters of milk per year. The oxen are easily fattened, and the meat is of very desirable quality.

XIV.—The Angeln Race.

This race sits in the low countries of Schleswig, between the German and the Baltic Oceans. There is considerable of stock-breeding in that country of rich and expansive meadows, and large numbers of young cows are annually sent from there into Mecklenburg, Holstein, and Pomerania to stock the dairies of those countries. They are red-brown, of medium size, frugal feeders, and good milk givers. A branch of this race, called Tondern cattle, is much sought by large estate-owners, because heavier and better built and in other respects superior to the ordinary run of the race.

XV.—The Podolische Race.

Originally imported from Southern Russia, this race has become chiefly remarkable from the fact that it has brought the disease known as "rinderpest" into Germany, on which account it is still looked upon with distrust. But its meat is so desirable, and its power of resistance against disease and the influences of climate so great, that nevertheless it is much sought. The percentage of deaths among this cattle, in case of the prevalence of "rinderpest," is less by two-thirds than among other races, while foot and mouth disease and lung diseases are very rare among them. It is not much known in the interior of Germany as

* For portrait of Voightland cow, see report on Voightland cattle, by Consul Bullock, of Annaberg.

yet, but it is claimed that 75 per cent. of all the beef consumed in Vienna, and a large part of that consumed in Paris, is of oxen of the Podolian race. The cut shows the build of the animal, its color, and peculiar horns. It is claimed that this race is a direct descendant of the *Bos primigenus*. It is bred for meat alone, being unfit for draft purposes and yielding but little milk—not more than one-fourth of other races of its size.

XVI.—The Mürzthaler Race.

This race has also made but little progress into the interior of Germany, having as yet penetrated no farther than the extreme southeastern parts of Bavaria. They are of gray color, somewhat heavier than the Podolians, yield more milk, and represent a sort of connecting link between the steppe and the mountain races.

PRICES OF GERMAN CATTLE.

The following are the prices of the different races of cattle herein described in German marks—1 mark equal to 24 cents—excepting the Alb and Podolian races, of which I have been unable to ascertain the price. The figures refer to specimens of from four to five years of age:

No.	Race.	Milch cows.	Bulls.
1	Neckar	450 to 500	600 to 800
2	Simmenthaler	600 800	800 1,000
3	Limburger	400 450	500 600
4	Triesdorfer	400 450	500 600
5	Alb		
6	Schwab Hall	300 400	400 600
7	Holland	500 600	
8	Montafoner	500 600	500 600
9	Wiesbacher	600 700	700 800
10	Pinggauer	500 600	500 600
11	Allguner	400 500	500 600
12	Schwytzer	600 800	600 800
13	Voightlander	450 550	450 550
14	Angeln	400 550	400 550
15	Podolische		
16	Mürzthaler	600 800	600 800

CATTLE EXPORTS TO THE UNITED STATES.

The Frankfort district, and indeed the entire Prussian province of Hesse-Nassau, is a cattle-purchasing community, the number of cattle bred falling very largely below the number consumed and needed. Hence there is no export of cattle from this neighborhood. The freight for cattle from this point to Antwerp would cost about $18 per car holding nine head, or $2 per head; attendance, feed, and other incidental expenses would amount to about $4.50 per car, making 50 cents per head; in all, $2.50 per head to Antwerp. From that point the White Star line of steamers to the United States charge £6, or $29.20, to New York, making the total cost of transportation $31.70 per head.

IMPROVEMENT OF CATTLE IN GERMANY.

In conclusion it may be stated that the efforts of the farmers and cattle-breeders of Germany to improve their stock have been as intelligent as they have been persevering, and that the result of these efforts has

Julius Bien & Co. Lith.

MURZTHALER RACE

been and is a type of cattle in the different regions of the country entirely adapted to the necessities thereof. Thus it may be said that in general the finer milk-yielding mountain-races are found in the more mountainous parts of the Empire, while the heavy cattle for draft and butchering purposes may be seen in large herds on the extensive meadows of the north.

FERDINAND VOGELER,
Consul-General.

FRANKFORT-ON-THE-MAIN,
January 26, 1884.

CATTLE IN GERMANY.

REPORT BY CONSUL SCHOENLE, OF BARMEN.

HERD-BOOKS AND CATTLE-BREEDING.

It is a historical fact that rational and methodical animal-breeding goes hand in hand with the social and economical status of a people. Wherever civilization and the consequent economical relations of a people are not gradually developed, there the domesticated animals remain more or less in their full originality, and the *primitive* breeds are retained; as, for instance, the small pony-like horse in Upper Silesia and Lithuania, the Merino sheep in Spain, and the high-boned, flat-ribbed hogs in Gallicia and Poland. It is therefore but natural that we find the first systematical and successful breeding of live stock in England, where it was improved by experiments and supplemented by scientific methods, thus producing cultivated breeds, which possess a larger inbred producing power than the primitive breeds, which are characterized by a relatively small producing power and by one-sidedness in their performances. England, the cradle of noble-animal breeding, was the first European country which introduced and utilized the so-called cattle and herd books, in which not only the breed but also the color, age, and origin of the animals are minutely entered. In course of time these record books show far-reaching pedigrees, such as the English "Shorthorn Herd-book," founded in the year 1822, exhibits. These herd-books furnish very valuable material for the improvement of the knowledge of animal-breeding and for the critical examination of the breeds and families of animals.

The American stock-raisers availed themselves of the excellent breeding methods of the English, and have since then improved them considerably, and the competition into which American stock-raisers were able to enter with their fellows in the Old World is, to a great extent, to be attributed to their intelligent and advanced breeding methods. In the United States the great value of the herd-books was soon realized, so that the first American herd-book, issued by Mr. Lewis F. Allen in the year 1846, met the hearty approbation of agriculturists as well as stockmen, and its usefulness was so keenly felt that since that time similar herd-books have made their appearance in different parts of the country.

France, Holland, and Switzerland are also in the enjoyment of general herd-books, while Germany does not yet possess a general one, for the one issued by Mr. Stettegast, in 1867, is but a private enterprise, and has

only reference to certain districts. There are, however, strenuous efforts being made by several local cattle-breeding associations for the introduction of a general herd-book, and the German Cattle-breeding and Herd-book Society, founded in Berlin in the year 1880, has already laid down the fundamental principles for such a record book.

CATTLE-BREEDING OF GERMANY.

Live stock in Germany is comparatively not very dense in any district. Northern and Northeastern Germany, with the exception of Schleswig-Holstein and the marshy districts in Oldenburg, is especially poor in cattle and stand in striking contract with the proportionate cattle richness in the fertile regions of South, Middle, and Western Germany. The head center in cattle-breeding is to be found in the Kingdoms of Bavaria and Wurtemberg, where 3,000 to 4,000 head of cattle average to a German square mile. The poorest districts in cattle are East Pomerania, the province of Brandenburg, the Lunneburger Heath, and the low German moorlands with but 500 to 700 head to a square mile.

This district (Barmen), the narrow Valley of the Wupper, being flanked by a chain of wooded hills on both sides, and the soil being clayish and stony, is chiefly and almost exclusively devoted to industrial pursuits. Agriculture could find neither encouragement nor development, and in consequence thereof cattle-breeding could not be fostered. Cattle-breeding not having the least foothold in this district, all the cattle have to be imported for dairy and slaughtering purposes. In preparing this report I am, therefore, unable to furnish the desired information as to cattle-breeding in this district, so am constrained to dwell but on the general features of the stock of cattle, and lay the most stress on the compilation of statistical tables and the comparative statements of the status of these cloven-footed animals in other German districts and other European countries.

THE SEVERAL BREEDS IN GERMANY.

There are but few distinctly *pure* breeds in Germany, as the Dutch (Flemish), East Friesland, Munsterland, Holstein, and Algau breeds.

The Dutch breed takes the first rank and furnishes the best and most prolific milch cows. They are generally heavy built and of red-checkered color.

The East Friesland breed is of a lighter frame, of dark-checkered color, and as to the quantity of milk second only to the Dutch cows.

The Munsterland is the next best breed. These cows are of a medium size, of reddish color, and their yield of milk is comparatively copious.

The Holstein breed is somewhat inferior to the foregoing, but is, however, of great productiveness and furnishes large supplies of slaughtering cattle for the English markets.

The Algau breed is the main one in Southern Germany and is frequently used for interbreeding purposes in Bavaria and Wurtemberg.

Other breeds produced by heterogeneous crossings, and consequently mixed ones, are to be found all over Germany, nearly every district throughout the German Empire possessing its peculiar breed.

In Southern Germany Swiss cattle are very frequently drawn upon for breeding purposes, and in the eastern provinces occasional crossings take place between German and Russian stock. On the whole these local breeds have not been improved in their succeeding generations. The Dutch and East Freisland breeds, which are driven into almost every German district, may be considered the predominant pure breeds in Germany.

CATTLE AND PRODUCT SUPPLY OF BARMEN.

As said in the preface, the immediate surroundings of Barmen and Elberfeld and the adjacent territory are covered with wooded hills and the soil is rather sterile. Consequently neither agriculture nor cattle-breeding could strike any root. The cows are kept only for dairy purposes, there is neither butter nor cheese production going on, the bulk of butter and cheese is drawn from Friesland, Holland, Switzerland, and the southern provinces. Cows are obtained either from the Munsterland or the Friesland or the Dutch breeds. The Munsterland cows yield from 10 to 15 liters of milk a day, and their price averages from $57.12 to $64.26; the Friesland cows yield from 14 to 20 liters of milk a day, and their price ranges from $71.40 to $85.68; the Dutch cows yield from 20 to 28 liters of milk a day, and their price is in the average from $99.96 to $107.10. The last breed is the finest and the most valuable one, and as the importation over the borders is closed from time to time on account of contagious cattle diseases in Holland, these cows can be procured very often with great difficulty. All the cows in Barmen and in its neighborhood are fed on grains and grounds and hay, and during the summer months partly on clover, and are generally kept in the stables. Very few of them are driven into the pastures. These milch cows usually yield milk for a year or fifteen months; then they become dry, when they are fattened for the butcher. Those cows are replaced by a fresh supply from Munsterland or Friesland or Holland, and this process is continually repeated.

TOTAL NUMBER OF CATTLE IN GERMANY.

The census of live stock in Germany is taken every ten years. The last one was taken January 10, 1883. The following statement exhibits the aggregate number and the different kinds of cattle in the whole German Empire in the year 1873:

Calves below one-half year	1,469,581
Young cattle from one-half to two years	3,545,572
Cows	8,961,221
Oxen	1,564,741
Bulls	235,587
Aggregate number of cattle in 1873	15,776,702

The number of cattle in the German Empire averaged 1,606 head to a German square mile, and 38.4 to every one hundred inhabitants in 1873. The census of 1883 is not obtainable at this time; the aggregate number will, however, most likely exceed that in 1873 but very little. The excess in cattle of home demand is comparatively small, the surplus is exported to England and a small lot to France. The surplus in 1876 amounted to 56,942, in 1878 to 24,582, in 1880 to 90,224, and in 1881 to 86,893 head of cattle.

The cattle census in the Kingdom of Prussia resulted as follows:

Years.	Cattle to a German square mile.	Cattle to every one hundred inhabitants.	Total cattle.
1883	1,395	32	8,735,599
1873	1,361	35	8,639,514
Increase			96,075

The number of cattle in the two provinces of Westphalia and Rhenish Province, large portions of which belong to this consular district, is exhibited in the following table:

Province.	Years.	Cattle to a German square mile.	Cattle to every one hundred inhabitants.	Total cattle.
Westphalia	1873	1,537	32	567,975
Do	1883	1,438	25.7	526,503
Rhenish Province	1873	2,003	27	962,631
Do	1883	1,956	23.7	966,880

There is to be observed a slight decrease in both of these provinces, and the increase in the Kingdom of Prussia, as the respective tables show, is rather insignificant.

The census of cattle taken in the Government district of Dusseldorf January 10, 1873, resulted in 204,609 head, as against 200,458 January 10, 1883.

The number of cattle in the municipal district of Barmen amounted to 1,065 head in 1873 and to 1,322 in 1883, and in the municipal district of Elberfeld to 1,120 in 1873 and to 1,587 in 1883. The number of households owning cattle in the Kingdom of Prussia amounted to 3,124,046 in 1883 as against 2,977,953 in 1873.

CATTLE CENSUS OF EUROPE.

The following table exhibits a synopsis of the stock of cattle in the several principal European states, with the exception of Turkey:

Countries.	Aggregate number.	Number to a German square mile.	Countries.	Aggregate number.	Number to a German square mile.
Great Britain	6,125,491	1,412	France	11,284,414	1,175
Ireland	4,118,113	2,691	Portugal	528,474	320
Norway	950,000	165	Spain	2,904,598	320
Sweden	2,103,319	284	Italy	3,489,125	648
Russia	22,770,000	214	Switzerland	993,291	1,327
German Empire	15,770,702	1,006	Austria	7,425,212	1,362
Denmark	1,238,898	1,784	Hungary	5,279,193	897
Netherlands	1,377,002	2,809	Greece	109,904	121
Belgium	1,242,445	2,322			

CLIMATE AND TEMPERATURE OF BARMEN.

As to the climate and temperature of Barmen the following is referred to. The calculation is based on the system of Celsius: Altitude, 154.8°; mean temperature, 7.3°; in January, 1.2°; in July, 13.7°. The foregoing calculation is the result of twenty-three years' observation. The rainfall averaged 700^{mm} per annum.

CATTLE SLAUGHTERING IN GERMANY.

Since the communication by railroads and steamboats has become so extensive and so universal, the transportation of live stock for slaughtering purposes has attained enormous proportions, and the cattle markets of old have given way to large stock-yards, and in nearly all the large

cities private slaughtering rooms have been replaced by common slaughter-houses which are generally attached to the stock-yards for the accommodation of the butchers. The central stock-yards in Berlin are the largest and most frequented in Germany, and form, in fact, the central point of cattle dealing for North and Middle Germany. They are as extensive and as well provided with all the modern improvements and accommodations as the Chicago stock-yards. The principal cattle market in these yards takes place every Monday, and on that day 35,000 head of live stock change hands on the average.

There are similar stock-yards in several other German cities, as, for instance, in Breslau, Magdeburg, Nuremberg, Wurzburg, Stuttgart, &c., and all these stock-yards are connected with the railroad depots by special tracks which enable the direct transport of cattle to these establishments. The stock-yards in Elberfeld, which have been opened June 16, 1879, supply the densely populated Berg-Markish territory with most of the slaughtering cattle. There is also a slaughter-house attached to these yards.

ELBERFELD ABATTOIR.

The following two exhibits embrace the number of animals slaughtered at the Elberfeld abattoir within the period from June 16, 1879, to October 1, 1883. In the first exhibit the so-called grand cattle is divided into two species, viz, oxen or steers having a live weight of 400 kilograms or more; (2) cows or heifers. At the beginning of this year slaughtering-cattle were divided into four classes, as will be seen in the second exhibit, viz:

(1) Oxen or steers, having a live weight of 400 kilograms; (2) cows, having a live weight of more than 400 kilograms; (3) cattle, having a live weight from 250 to 400 kilograms; and (4) neat cattle, having a live weight from 130 to 250 kilograms. The first two divisions include the heavier, the third the lighter, stable and grass fed animals, while the fourth class includes animals of small size, and their meat is almost exclusively used by the hog butchers for making sausages.

EXHIBIT I.

Description.	1879–'80.	1880–'81.	1881–'82.
Oxen or steers, alive, 400 kilograms or more	3,893	6,110	7,007
Cows or heifers	3,098	4,188	4,009
Calves	8,488	11,980	12,599
Sheep	10,534	10,113	10,394
Hogs, slaughtered, over 35 kilograms	11,388	14,761	14,403
Hogs, slaughtered, up to 35 kilograms	35	51	57
Horses	123	169	225

EXHIBIT II.

Description.	1882–'83.	Description.	1882–'83.
Oxen or steers, alive, more than 400 kilograms	10,197	Calves	15,842
Cows, alive, more than 400 kilograms	1,952	Sheep	12,987
Cattle, alive, from 250 to 400 kilograms	2,181	Hogs, slaughtered, over 35 kilograms	26,492
Neat cattle, alive, from 130 to 250 kilograms	1,333	Hogs, slaughtered, up to 35 kilograms	68
		Horses	338

From the above tables it will seen that the number of slaughtered horses is steadily increasing.

The following table gives an inside view into the movements of the stock-yards from June 16, 1879, to October 1, 1883.

Years.	Grand cattle.	Hogs.	Calves.	Sheep.
1879–'80	8,522	24,216	9,459	14,877
1880–'81	14,111	36,629	14,312	15,021
1881–'82	17,386	35,756	16,071	16,088
1882–'83	20,871	35,872	12,732	12,300
1883, from April 1 to October 1	11,904	15,456	8,382	7,571

The average weight of the slaughtered animals is as follows: Of oxen and steers enumerated in the first column of Exhibit II, 325 kilograms; of cows in the second column, 275 kilograms; of cattle in the third column, 175 kilograms; of neat cattle in fourth column, 75 kilograms; of calves in fifth column, 40 kilograms; of sheep in sixth column 20 kilorgams; of hogs in seventh column, 95 kilograms.

All animals slaughtered in the Elberfeld municipal slaughter-house are domestic ones, and nearly all of them are bought at the adjoining stock-yards.

From January to August fattened cattle are brought in by cattle-dealers from the central stock-yards in Berlin, or directly from the large farms in Silesia, Posen, East Prussia, and the landed estates near Magdeburg. The trade in grass-fed cattle lasts from August to January. During this period the market is not well frequented by butchers, as they generally obtain their cattle from the cattle markets in Schwelm, Westphalia, and Neuss, Rhenish Province. The cattle which are brought to the Elberfeld stock-yards during this period come from Holstein, Oldenburg, Hanover, from the pastures on the Ruhr, and the Lower Rhine, and a small part from Holland. Most of the cows and neat cattle are brought in from the provinces of Westphalia and Hanover. Westphalia, Hanover, and Holland furnish most of the calves. Sheep come from the central stock-yards in Berlin, and from Westphalia and the Rhineland. Hogs are brought in from Westphalia, Hanover, Holstein, and Mecklenburg.

Thus it will be seen that the valley of the Wupper must be furnished with live-stock for the dairy and the butcher from different parts of Germany.

PRICES OF CATTLE.

The price for slaughtering-cattle averages, for first quality, from $119 to $126.14; for second quality, from $107.10 to $114.24; for third quality, from $90.44 to $99.96; for fourth quality, from $76.10 to $80.92; for cows of first quality, from $109.48 to $114.24; of second quality, from $102.34 to $109.48; of third quality, from $90.44 to $97.58.

It may be stated in this connection that in Germany and throughout Europe cattle for slaughtering are not sold by the live weight, as it is done in the United States. There is, however, a lively agitation going on in England and on the continent to imitate the United States in this respect and to introduce this rational and practical method.

CATTLE-INSURANCE COMPANIES.

State and local cattle-insurance companies, both based on terms of reciprocity of their members, work hand in hand and alongside of each

other. These insurance societies are very numerous throughout Germany, and redound principally to the benefit of small farmers, and, on the whole, are managed very economically. The average premium on the insurance policy is 3 per cent., and the amount of compensation for animals that have to be butchered on account of accidental injuries, or that have died, averages 75 per cent. The animal goes into the possession of the insurance company. Is the injured animal still fit for the slaughter-house, it will then be sold to a butcher at a low price. When the animal has died, only the hide can be utilized, and the carcass is utilized for fertilizing purposes. The insurance system has developed to a high degree in the Government district of Dusseldorf. The different cattle-insurance societies within this district numbered 6,623 members, the insured animals of the bovine race 14,519, and the amount for which animals were insured was 2,889,862 marks, and the premium paid in reached the sum of 88,767 marks in the year 1882.

IMPORTATION OF AMERICAN BEEF CATTLE INTO GERMANY.

In view of the fact that the consumption of beef meat is proportionately increasing in the ratio to the annual increase of the population in Germany, and in the face of the comparatively high price of beef cattle, it may be worth while for American stock breeders and exporters to seriously consider the question whether the importation of American beef cattle into Germany would not eventually turn out to be profitable. The stock cattle, independent of milch cows and oxen, is continually increasing in the United States. It has increased from 1870 to 1880 about 66 per cent., and the aggregrate number of stock cattle in the United States, will, at this writing, probably not fall below 27,500,000, while its increase in Germany is very slow and out of proportion to the increase of population. German stock-raisers are even now somewhat alarmed at the prospect that American cattle-breeders may import large quantities of beef cattle into Germany in the near future, as a start has lately been made by importing lean cattle to Schleswig-Holstein, where they were fattened for the market, and the venture has proved to be satisfactory. The import duty for steers and cows is $1.42½ per head; for oxen, $4.76 per head, and for young cattle up to two and a half years old 95¼ cents per head. In consideration of all these facts the time may not be very distant when the United States will add a new article to its German export list and that, as soon as the requisite dispositions for the safety of the animals will have been completed on board the steamships, American beef cattle may be landed at German sea-ports, and the German laboring classes, on whose tables good and substantial beef meat is quite a rarity, may be supplied with cheap and wholesome American beef.

WOLFGANG SCHOENLE,
Consul.

UNITED STATES CONSULATE,
Barmen, November 23, 1883.

CATTLE BREEDS OF GERMANY.

REPORT BY COMMERCIAL AGENT WAMER, OF DUSSELDORF.

The different breeds of cattle in Germany may be divided into three heads, the lowland breeds, the mountainous breeds, and the middle breeds.

For milk-producing, cattle are cultivated in Germany, (*a*) in the lowlands (plains, marshes, &c.), with good soil and stable feeding, the Dutch breed, and (*b*) in the mountainous and rocky regions, where the soil is heavy, the Simmenthal, the Montafun (Swiss breeds), and the Algau (from the Algau, in Bavaria) breeds. The object of cattle-breeding in Germany is chiefly for milk, butter, beef, and labor. There is comparatively little cheese made here; it is imported mostly from Holland and Switzerland.

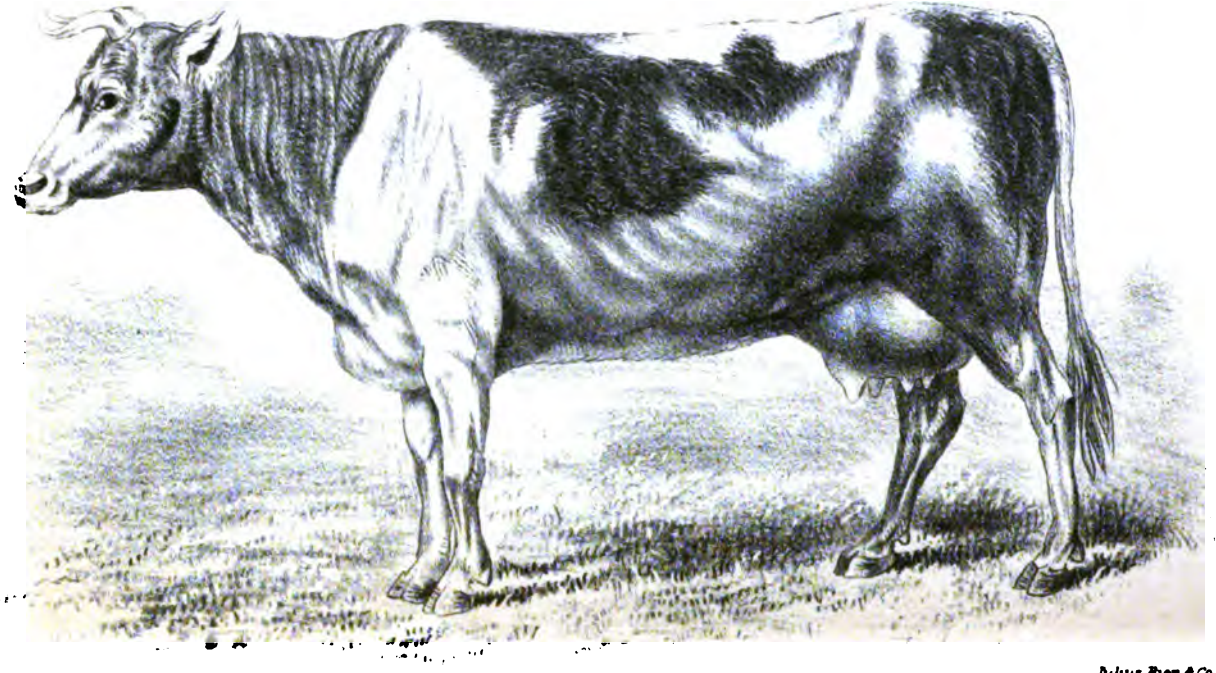
THE DUTCH BREED.

The Dutch breed (Fig. 1) is very largely cultivated in the districts of Cleve and Rees, on the boundaries of Holland, Regierungs-Bezirk Dusseldorf, and in the lowlands of Lower Rhineland (Nieder-Rheinland). This cow belongs by nature to lowlands of a moist and marshy character and where there is much green vegetation. It has a small and long head; horns short and projecting over the forehead, with the points turned a little upwards; mouth sharp; neck thin and long, with scarcely any dew-lap; the body is long and big, with an even back; feet high; skin tender; color black and white, red or brown and white, gray and white, white or black, and mostly spotted. The cows are not beautiful, but they produce large quantities of milk, breed heavy calves, good working oxen, and are also fine meat. In this immediate neighborhood (Dusseldorf) they are mostly kept in stables, and the one I visited a few days ago contained forty head.* The proprietor informed me that the average yield of milk for each cow was from 14 to 15 liters† per day. One Oldenburg cow amongst the lot was pointed out to me as giving 25 to 30 liters per day. Live weight of the Dutch cow is from 650 to 750 kilograms, and the market value here is from 400 to 600 marks (1 mark is equal to about 23.8 cents American money). In consequence of this breed of cattle being easy to get accustomed to strange climates and the wonderful capacity of the cows for producing milk they are kept in the neighborhood of large cities. Fine and valuable breeds are obtained by crossing them with other breeds. The celebrated Durham cow is a cross breed from the Dutch cow.

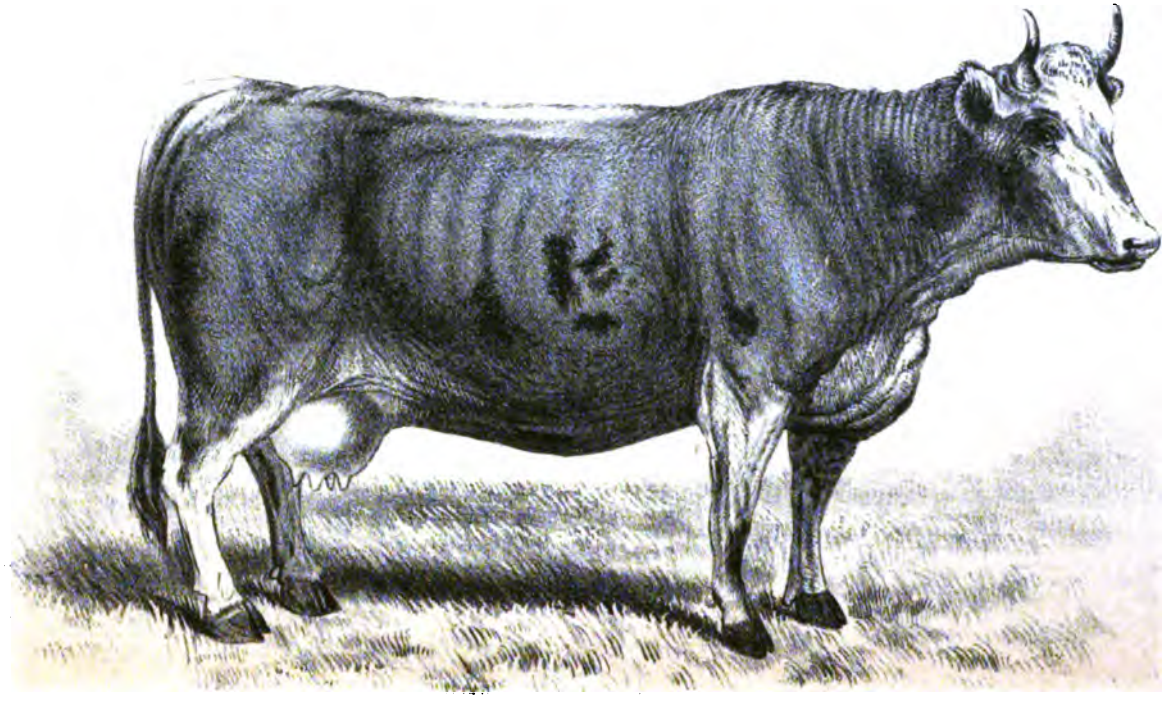
SIMMENTHAL BREED.

Simmenthal lies between Stockhorn and Niesen, near Thun, in Switzerland. This valley abounds in fertile fields and luxuriant pastures extending high up on the slopes of these mountains. It is divided by a rivulet, the Simme, and furnishes the celebrated yellowish-red spotted cattle of the canton Bern, which have been most frequently imported to cross with the native cattle of Southern Germany. The middle breeds produced from the crossing are said to be very excellent cattle. In Switzerland the prices remain high, and the inquiry this year (1883) has

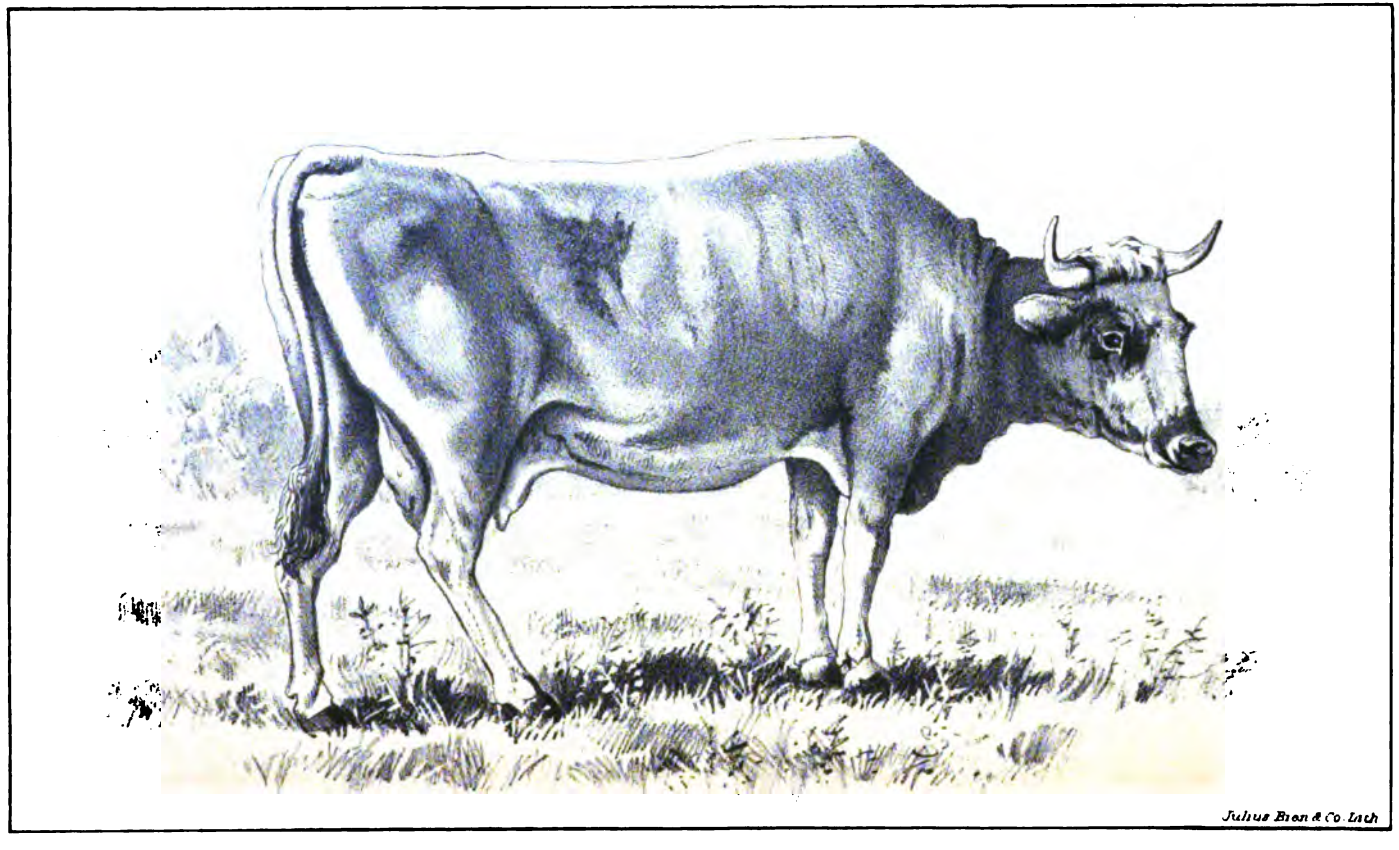
* The average daily cost of food for each cow amounted to about 35 cents.
† Liter = one quart.



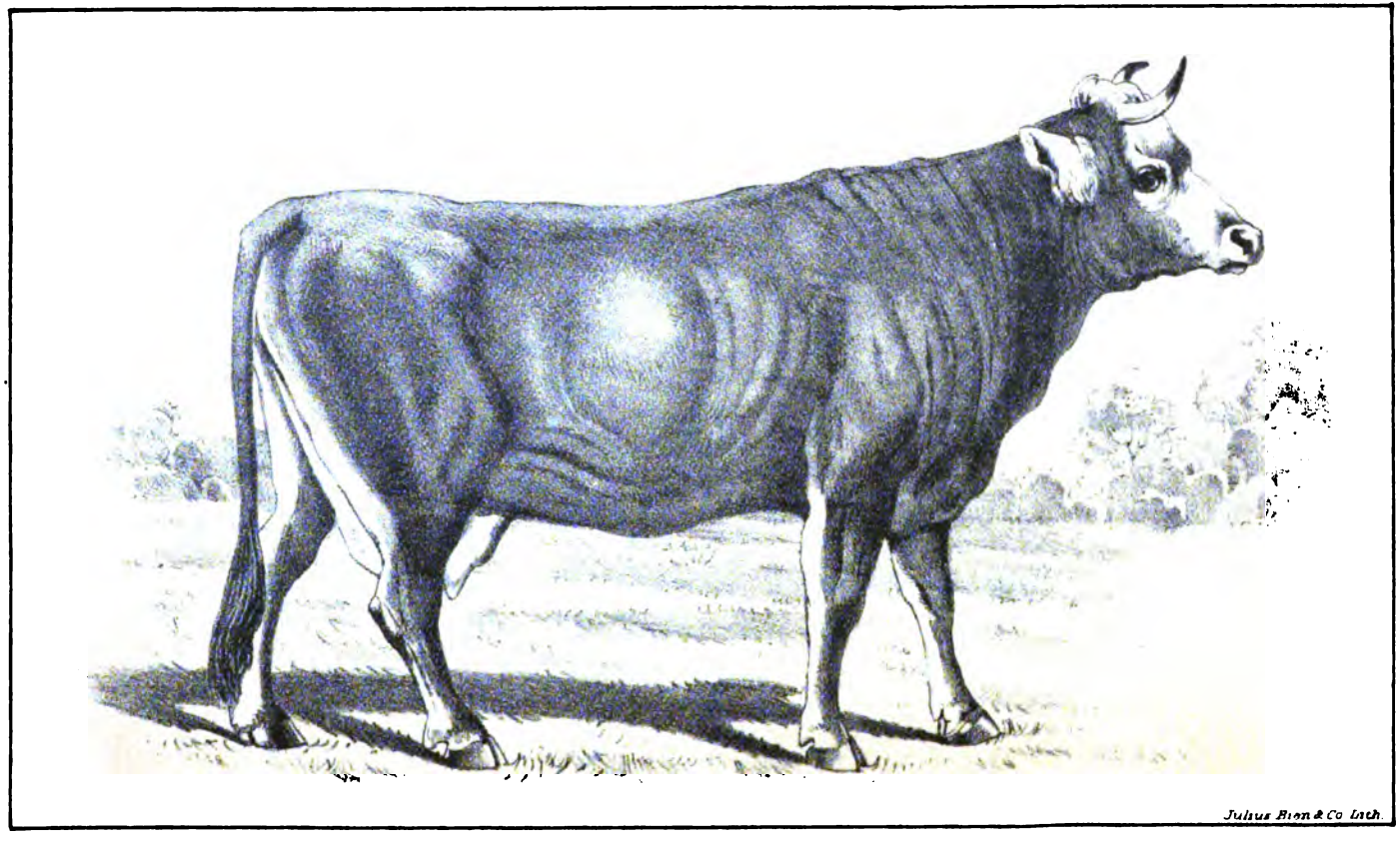
DUTCH COW



SIMMENTHAL COW



ALGAU COW



SWISS COW (MONTAFUN BREED)

been on the increase. Particularly in the Simmenthal* the demand exceeds the supply. The live weight of a Simmenthal cow ranges from 600 to 750 kilograms (Fig. 2). The oxen vary from 900 to 1,000 kilograms. Milk of the Simmenthal cows is sweet and contains much fat.

SWISS OR RIGI BREED.

The cattle of the Swiss or Rigi race are very large and heavy; live weight, from 750 to 800 kilograms. The muscles and bones are heavy and strong, and the body in general well developed. Color is dark-brown to light gray, with light yellow about the belly. This breed requires much food and is hard to get accustomed to strange climates.

MONTAFUN BREED.

Next to the Simmenthal in importance is the Montafun Valley. It lies south of Bludenz, in Tyrol, and is about 50 miles long, is very populous, and has rich pastures. The lower parts of the valley are watered by the river Ill. The fields yield summer wheat, rye, barley, oats, potatoes, and flax. Labor is done in the fields entirely with the spade, and even the wagons used on these farms are drawn by human hands.

The Montafun cow (Fig. 3) belongs also to the heavy race. The live weight is from 450 to 500 kilograms. The oxen are proportionally large and heavy. A still heavier breed is obtained by crossing it with the Rigi breed. The bones of the Montafun cattle are strong and of middling sizes, color similar to the Rigi breed, mouth, ears, and back being a little lighter. A dark-brown color is preferred. The head is large and broad, horns white at the base and changing to black towards the ends, neck of medium size, with a large dew-lap. The limbs are well formed, udder large, and indicating a good supply of milk. With good feeding each cow will yield 2,000 to 2,500 liters of milk yearly, which, owing to its richness in fat, is used chiefly for making butter and cheese. Owing to the superiority of this breed the cattle are frequently exported. There is an annual market at Schruns (1,956 feet above the level of the sea) in September, and the cows bring an average of 150 to 240 marks a head. The sale, though, of the better specimens of these cows, is said to have somewhat impaired the home breed.

ALGAU BREED.

This breed comes from the Algau Mountains, in Wurtemberg and Bavaria. (Fig. 4.) The cows are a little smaller than the Montafun breed, but they are quite distinguished in Wurtemberg, Bavaria, and Saxony for giving large yields of milk that contain much fatty substance. In fact, the Algau cows of Saxony are said to surpass all other breeds there for producing milk, as the following figures of the comparative quantities of milk will show:

	Cans.†
Native cows	23.16
Oldenburg	24.25
Amsterdam	25.56
Algau‡	27.38

* It is said that the best cheese is made upon pastures 3,000 feet above the level of the sea, in the vales of Simme and Saanen, and in the Emmenthal. The best cows there yield in summer between 20 and 40 pounds of milk daily, and each cow produces by the end of the season of four months 2 hundred-weight of cheese.

† A Dresden can is equal to 0.933 liter.

‡ About 12 cans of the milk of the Algau cow are required to give 1 pound of butter, while there are 14 cans of milk necessary from the Dutch cow.

Live weight of Algau cow is from 400 to 450 kilograms. Those I saw a few days ago in a stable here were said to weigh as much as 500 to 600 kilograms. They are also excellent for labor and fattening.

A good Algau cow will yield 2,500 to 2,800 cans of milk yearly, which is only a little less than the best Holland cows are capable of producing. The trade in these cattle is pretty lively, and the market is held at Southofen (2,249 feet above the sea-level) in the middle of September and at the end of October. The first is the most important.

The Algau beed is very widely distributed over Germany. Excellent breeds of cattle are to be found all over Germany, principally in Wurtemberg, Bavaria, Thuringia, Rhineland, and Schleswig-Holstein, which may be classified as follows:

I.—*Wurtemberg:* (1) Alb, (2) Teck, (3) Neckar, (4) Schwäbisch Hall, (5) Limburg.
II.—*Bavaria, Thuringia, and Rhineland:* (*a*) (1) Upper Main, (2) Itz Main, (3) Oxenfurth, (4) Scheinfeld. (*b*) (1) Glau (river Glau), Fig. 6, (2) Donnersberg, (3) Birkenfeld. (*c*) *Native Bavarian cattle:* (1) Miesbach, (2) Kellheim, (3) Spesshardt, (4) Rohn Mountain. (*d*) *Hessen Nassau:* (1) Vogelsberg, (2) Westerwald.
III.—*Schleswig-Holstein:** Marshland: (1) Elderstedt, (2) Ditmarsh, (3) Breitenberg, (4) Wilstermarsh. Alluvial soil: (1) Angel, (2) Tondern.

FATTENING CATTLE IN GERMANY.

Beet-root food.—A great source of agricultural economy to Germany is the culture of the beet-root. Here it has not only proven valuable in the manufacture of sugar, but also for fattening cattle, and dairymen estimate it very highly for feeding purposes. The pressed beets from the factories (*i. e.*, the residue left after the juice has been removed) furnish also highly nutritious materials for food. For all practical purposes the nourishing value of this residue may be estimated in proportion to the amount of protine or nitrogenous substances it contains. In general there is in every 100 parts of the fresh or 30 parts of the dried substance 2 parts albuminoids, 18 parts non-nitrogenous matter, 6 per cent. pure fiber, and 3.4 per cent. ash; the fat may be reckoned as 2 per cent.

According to an analysis by Gohren, pressed beets contain:

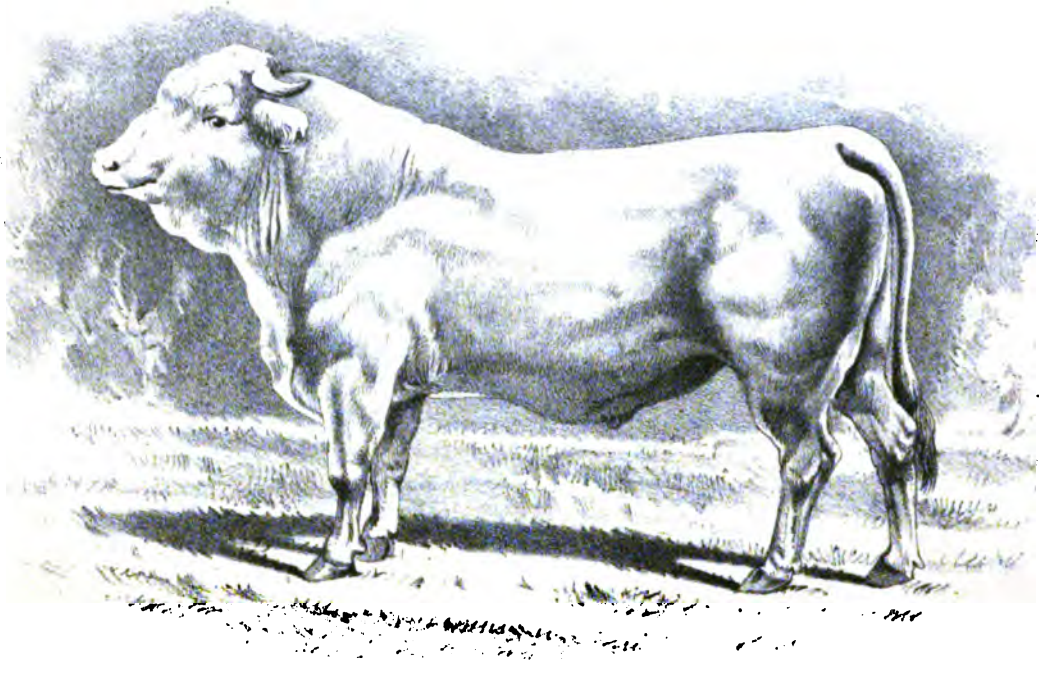
	Per cent.
Water	73.668
Ash	1.544
Albuminoids	1.599
Carbohydrates	18.383
Fiber	4.575
Fat	.221

Nutritive value, 1: 11,4.

Heidepriew gives as the results of his analyses of the clean ash of the residue from three different factories, the following figures:

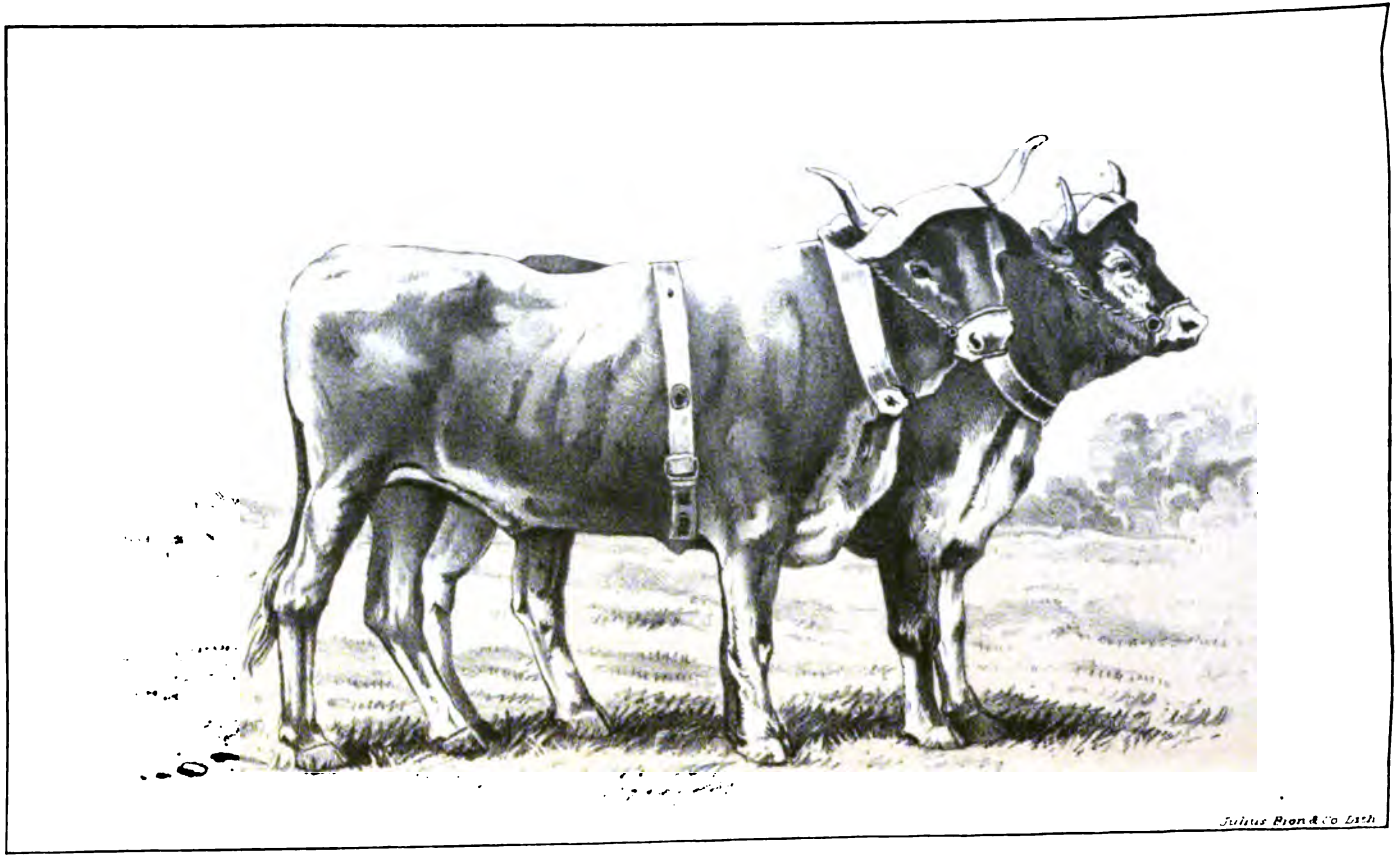
Constituents.	(a)	(b)	(c)
Potash	35.88	20.84	30.76
Soda	6.31	12.34	4.98
Lime	11.59	26.71	21.56
Magnesia	7.96	22.27	4.28
Oxide of iron	3.63	0.96	3.19
Phosphoric acid	5.28	7.43	4.92
Sulphuric acid	1.88	2.91	2.22
Silica	20.97	4.76	25.23
Chlorine	1.54	0.71	1.54

* These cattle are very largely exported to England for beef.

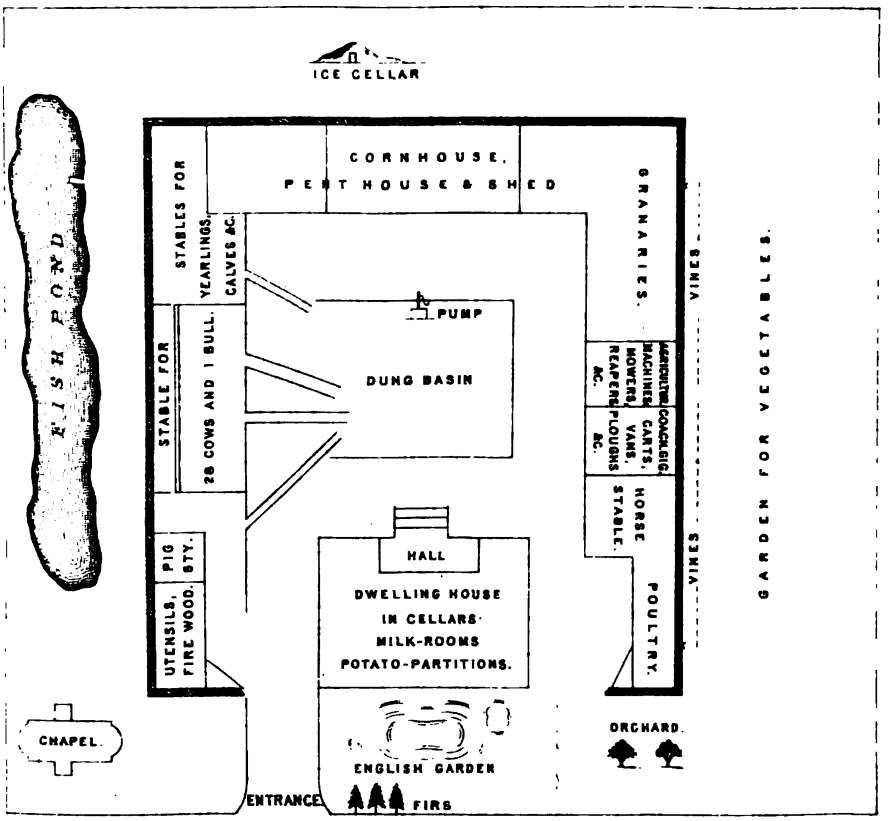


Julius Bien & Co. Lith.

BULL OF THE GLAN (GLAN BULL)



BAVARIAN WORKING CATTLE



SKETCH OF A FARMHOUSE AND SURROUNDINGS,

ON THE DECLIVITY OF THE "SEVEN MOUNTAINS",

ABOUT 6 ENGLISH MILES DISTANT FROM THE RHINE.

Julius Bien & Co. Lith.

When sugar-beet residue is covered in pits for safe-keeping, and to likewise increase its digestible value, there takes place very shortly afterwards, with a rapid rising of temperature, a lively fermentation, and alcohol and acetic acid and lactic acid and ammonia are formed. The so-formed acid residue may be preserved for a long time.

The chief constituents of this acid residue, as determined by Professor Maecker, are as follows: Water, 75.54 per cent.; dried substance, 24.46 per cent.; nitrogen in dried substance, 1.22, in the fresh, 0.03 per cent. In the fresh and dried substance there are contained, respectively, 2.573 per cent. and 10.519 per cent. albuminoids.

Cotton-seed cake: Of the latterly imported food stuffs into Germany for animals, that of cotton-seed cake stands very high as a valuable material for fattening cattle, owing to its containing much albumen (40 to 50 per cent.) and a considerable amount of fat (10 to 20 per cent.).

STATISTICS OF OX FATTENING.

The following table of calculations on the fattening of oxen have been furnished by Mr. Valentine Pfeifer, the proprietor of a cattle farm in the Rhenish Province, who has continually in his stables about forty head of oxen of the Alsatian and Glau breeds, they being considered here the best for labor and fattening. The manure is removed from the stables at intervals of every three and four months, the racks being so arranged that they can be raised in proportion to the accumulation of the manure. The food consists of beet-root residue, chaff, hay, oil cake, and wheat clover (Weizen Klee). They are fed three times daily. Duration of labor of the oxen is limited to two years. Afterwards they are turned over to the fattening stables (Maststall). According to the books kept the fattening lasts about forty-four days.

Six oxen fed with various quantities of the above food by Mr. Pfeiffer for fattening:

Weight on the 10th of March: (1) 1,040 pounds; (2) 1,080 pounds; (3) 1,225 pounds; (4) 1,145 pounds; (5) 1,200 pounds; (6) 1,210 pounds.

They were put up for fattening on the 5th of September, and showed the following progress:

Date.	1.	2.	3.	4.	5.	6.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
September 5	1,403	1,408	1,245	1,220	1,410	1,393
September 12	1,420	1,425	1,283	1,245	1,450	1,398
September 19	1,460	1,415	1,300	1,250	1,450	1,400
September 26	1,460	1,435	1,310	1,263	1,425	1,390
October 3	1,456	1,485	1,330	1,245	.....	1,370

PRICES OF GERMAN CATTLE.

The last market report for this fall, published by reliable authority, states, among other facts—

The position of our northern land owners has not exactly improved, and many of them are necessarily forced to reduce their expenses as much as possible.

In the lowlands of Northwestern Germany heifers of first quality bring $100 to $105; calves, born in February and March, $32 to $36; good bulls, $120 to $143. In the Angel district (Schleswig-Holstein) there are paid for heifers of first quality $70 to $86. Older cows for milking off, $54 to $60. Denmark is, in these parts, the best purchaser.

The prices in Switzerland remain also high. In the valley of Simmen the demand exceeds the supply. In Bavaria the trade is likewise lively. The Voigtland, red-breed cattle, are in good demand, especially for labor.

Since the natural fertility of the lands of Germany has long become more or less exhausted, the question of manure must be viewed as of the greatest importance, and the state of cattle-breeding may be accepted as a good scale by which the prosperity of the agriculture in the country is to be estimated. In those parts of the country where there is much cattle-breeding the highest standard of agriculture exists.

WM. D. WAMER,
Commercial Agent.

UNITED STATES COMMERCIAL AGENCY,
Dusseldorf, November 3, 1883.

CATTLE IN PRUSSIA.

REPORT BY CONSUL-GENERAL BREWER, OF BERLIN.

STATISTICS RELATING TO CATTLE IN GERMANY.

In compliance with circular instruction of July 18, 1883, I have now the honor to submit a report respecting cattle in Prussia.

It has not been possible for me to obtain official information relating to all the points mentioned in the circular, and it was only with the greatest difficulty that the tables inclosed were obtained from private sources. A great deal of literature on the subject-matter is extant in Germany, and every point respecting breeding, treatment, and the physiology of the various breeds has been thoroughly discussed by men who have made the subject a special study for years, and whose opinions are entitled to respect. The result of their researches and investigations, as given to the world respecting cattle and cattle-raising, is of the greatest value.

CATTLE CENSUS OF GERMANY.

According to the census of 1883, the increase in the number of cattle since 1873 has been 15 per cent. in many provinces, and as much as 40 per cent. in others.

The greatest number of breeding bulls is found in Mecklenburg, Western Prussia, and the Duchy of Brunswick. About 50 per cent. of the cattle in Germany is in the Kingdom of Prussia, where, in 1873, there were 8,639,514 head, and in 1883, 8,735,559 head.

CATTLE IN EASTERN FRISIA.*

The cows of Eastern Frisia are especially remarkable for the abundance of milk which they yield. These cattle in form and build are heavier even than the Dutch cattle and stronger in the bone. A great many of them are sent to Mecklenburg and Pomerania, where, with ordinary good treatment, great results are obtained. Pasturage in Frisia is good and plentiful, as the majority of breeders devote nearly the

*The report of Consul Wilson, of Bremen, deals at length with Frisian cattle.

whole of the land to grazing. Although the soil is remarkably fertile but few farmers ever grow grain or even potatoes, preferring to purchase such articles.

There is no doubt but that this course brings more profit, as there is but little expense incurred in raising the cattle and the profits from the sales of breeding and fat cattle are large. All the manure of the cattle is used upon the meadows, and the meadows are alternately mown and pastured. The manure is made most useful, for as soon as it is covered by the after-growth it becomes dissolved and assimilates with the soil and its strength is not destroyed by the sun.

The dairy products are of the most excellent quality, although the quantity is hardly as great as the plentiful pasture would seem to warrant.

The following statement respecting cattle in Eastern Frisia, although not official, is quite reliable, it having been obtained from trustworthy private sources:

Soil: Loamy, sandy.

Average size of cow: Length, 2.55 meters; height, 1.31 meters at wither; height, 1.32 meters at rump.

Feeding: Up to the seventh week sweet milk, mixed with fine hay after first month; buttermilk after eighth week, mixed with oat-meal and barley. In winter, first year, beets, hay, and 4 to 6 liters of barley-meal daily.

Average live weights of steers: Three years, 1,120 pounds; four years, 1,510 pounds; five years, 1,875 pounds; six years, 1,620 pounds; seven years 1,430 pounds; eight years, 1,520 pounds; nine years, 1,400 pounds; average annual yield of milk of cows, 2,600 quarts.

Cultivated grasses: White clover and ray-grass.

CATTLE IN GRAND DUCHY OF OLDENBURG.

The great dairies around Berlin rely almost entirely for their supply of milch cows upon the cattle bred on the marshy pastures on the coast near the Jahde Bay and the Weser.

The breed differs from the Frisian inasmuch as it shows a heavier head and stronger horns and the buttocks are less broad.

In weight the cattle approach that of the Holland breeds. The live weight of cows will average about 1,200 pounds and that of oxen from 1,500 to 1,800 pounds. The udder in these cows is very largely developed and the yield of milk is considerable, reaching as much as 3,000 quarts a year from well-kept animals.

Like the Frisian breed these cattle require good pasture and also do well with ample stable food. The very best specimens of Oldenburg cattle are found in Budjahdingen.

The following statement contains some carefully collected information respecting these cattle:

Cattle in Oldenburg.

Age.	Length.	Height—		Weight.
		At withers.	At rump.	
	Meters.	*Meters.*	*Meters.*	*Pounds.*
2½-year-old steers	2.53	1.48	1.56	1,278
4-year-old cow	2.13	1.41	1.46	1,160
2-year-old cow	2.14	1.43	1.53	986

Soil: Sand; clay.
Average yield of milk: 2,900 to 3,500 quarts per year; 6¼ quarts per day; 14 to 16 quarts of milk to 1 pound of butter.
Cultivated grasses: Red clover; ray grass.
Handling products: Butter exported. Cheese made only for domestic use.
Feeding: Calves receive mother's milk two weeks; then skimmed milk and fine hay. At five months they are taken to pasture. Winter feed consists of two-thirds straw, one-third hay, 1 to 3 pounds of oats.

CATTLE IN SCHLESWIG-HOLSTEIN.

In the lower portions of Schleswig-Holstein crossings with English breeds have led to great improvements in cattle, and they are now exported to England in great numbers.

The butter produced here, also largely exported to England, is of an excellent quality, and the refuse from the great dairies is used with advantage for fattening hogs. The breed of cattle raised here form the connecting link between the lowland and highland cattle, and there are eight distinct varieties deriving their names from the several counties of the province. The cattle of Eiderstedt have been crossed with English Shorthorns. The calves receive their mother's milk only during the first few weeks. After two or three weeks, warmed skimmed milk is given them, and they are in a few months taken to pasture. The fattening commences in the third or fourth year, according to their development. The steers then reach a dead weight of from 800 to 1,000 pounds. Many of them are sent to the London markets, where they bring very good prices, whilst others go to Hamburg, from whence the meat, after being smoked, is shipped in great quantities.

The quality and quantity of dairy produce of the Eiderstedt cows are above the average, while those of the county Ditmarsh are rather inferior in their yield of milk. In Wilstermarsh and at Breitenburg, both the cattle for the dairy as well as for slaughter are very superior. Cows between three and four years of age attain a weight of about 900 pounds.

The most remarkable of all the cattle of Schleswig-Holstein are the cattle of Angeln and Tondern. At the age of five or six years the cows of Angeln and Tondern weigh between 800 and 1,000 pounds, and in the most favorable milking time produce daily 9 to 12 quarts of milk, which, by its fatty richness is especially adapted for the production of butter.

Fed plentifully these cows average an annual yield of 3,500 quarts of milk. Full pasture is given from May (after the cows have calved) until the end of October, the cows remaining out day and night. Every field has plenty of water, either in ponds made for the purpose or in large troughs filled from wells.

In the northern parts of Schleswig a breed of cattle is to be found which, although smaller than that of Angeln and Tondern, is remarkable for its magnificent build in the bone as well as for its adaptability for fattening. Being somewhat hardened by the manner of its rearing and its confinement to rather short pasturage, this breed is capable of wonderful improvement. Many are sent to neighboring countries, where they become longer in limb and still coarser in the bone, heavier in the head and horns and less neat in form, but are excellent for slaughter or the dairy.

Stock-breeders in the northwestern portion of our own country have for the last few years imported these cattle for the purpose of improving their own herds. In color these breeds are gray, or of a bluish-black with white spots.

The following two statements regarding the cattle of Schleswig-Holstein will prove interesting:

Cattle in Schleswig, Comprising Angeln and Tondern.

Description.	Length.	Height—		Weight.
		To withers.	To rump.	
	Meters.	*Meters.*	*Meters.*	*Pounds.*
Steers of from two and one-fourth to three and one-half years	2.62	1.36	1.43	880
Cows from three to seven years	2.58	1.32	1.39	805 to 890

Soil and temperature: Similar to Holstein, and an extensive growth of hazelnut and blackthorn affords protection to the cattle against high winds.

Average yield of milk: 2,200 to 3,000 quarts milk; very rich and fat; about 10 quarts to 1 pound of butter.

Feeding and housing: Calves intended for rearing are tied up from December to April; from ten days to two weeks they receive mother's milk, after this sweet skimmed milk, of which from 8 to 10 quarts are given. From May until October the cows are pastured, but housed during the cold nights.

Holstein cattle.

Description.	Length.	Height—		Live weight.
		At withers.	At rump.	
	Meters.	*Meters.*	*Meters.*	*Pounds.*
Steer, twenty months old	2.51	1.48	1.44	1,220
Steer, three years old	2.88	1.48	1.48	1,790
Cows, three years old	2.85	1.41	1.46	1,380

Remarks: In the report, the cattle of both Schleswig and Holstein have been grouped under one heading, but in the statistics it has been found necessary to make a division of the two provinces, the basis of the former being the Wilstermarsh cattle, that of the latter the Angeln and Tondern cattle.

Average yield of milk: 2,600 to 3,500 quarts. Average annual income per cow from butter, cheese, &c., $70.

Feeding: Calves receive mother's milk two weeks only; in three months they are sent to pasture. Winter feed consists of cut straw, with beets and hay and 3 or 4 pounds of oats.

CATTLE OF DUTCH DESCENT.

The marshy tracts of land situated at the mouth of the Weichsel and Nogat are among the most fertile river lands on the Baltic coast. They form a great delta-shaped plain which extends from Thorn to Dantzic.

In the thirteeneh century Dutch colonists brought cattle to this place, from which the breed now reared there sprung. It is, however, by no means equal to the Dutch breed, either in the yield for the dairy or for fattening.

In color great variety is found, ranging from a grayish-red to a spotted black. In cultivating the breed no regard has been paid to anything but producing the largest possible quantity of milk, which is rather watery and obtained at the cost of the strength of the animals.

The yield of milk is estimated at from 15 to 20 quarts a day during the first few months after calving, and an annual yield of from 2,500 to 3,000 quarts.

STATISTICS OF VARIOUS BREEDS.

Statements respecting their herds which I have obtained from several stock-breeders have enabled me to compile the following tables:

Statistics showing results of a five-years' trial of Frisian, Schleswig, and Silesian cattle on a stock-farm in Saxony.

Year.	Schleswig cows.			Frisian cows.			Silesian cows.		
	Average annual yield of milk.	Yield calculated to result from 1 cwt. of hay or its equivalent.		Average annual yield of milk.	Yield calculated to result from 1 cwt. of hay or its equivalent.		Average annual yield of milk.	Yield as calculated to result from 1 cwt. of hay or its equivalent.	
		Milk.	Butter.		Milk.	Butter.		Milk.	Butter.
	Quarts.	*Quarts.*	*Pounds.*	*Quarts.*	*Quarts.*	*Pounds.*	*Quarts.*	*Quarts.*	*Pounds.*
1877	2,932	29	2¼	3,272	27	2	2,212	22	1¾
1878	3,044	30	2¼	3,207	27	1¾	2,411	24	1¾
1879	2,856	28	2¼	2,993	24¼	1¾	2,018	20	1½
1880	2,810	28	2	2,676	23	1	2,303	23	1¾
1881	3,050	30	2¼	3,132	26	1¾	2,635	26	1¾

Statistics compiled from examination of various specimens of cattle from several farms in Prussia.

Cattle of Swiss origin.	Length.	Height—		Live weight.
		To withers.	To rump.	
	Meters.	*Meters.*	*Meters.*	*Pounds.*
Steer, 2½ years	2.40	1.51	1.51	1,315
Cow, 7½ years	2.69	.....	.....	1,281
Cow, 5 years	2.48	1.37	1.42	1,085
Cow, 8 years	2.59	1.42	1.43	1,233
Cow, 7 years	2.67	1.50	1.56	1,335

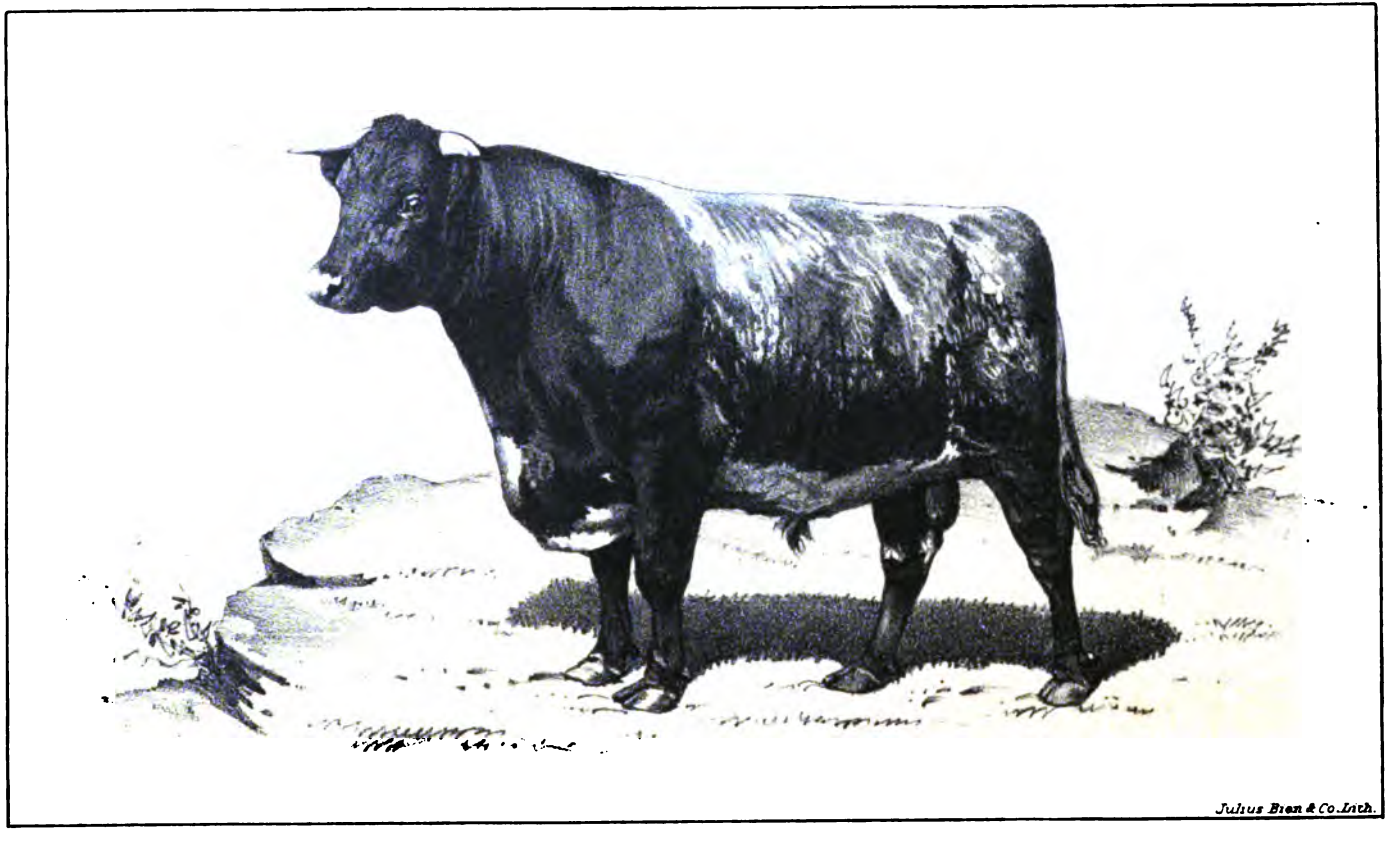
Annual average yield of milk, &c.: 2,500 quarts, of which 160 quarts averaged 8 pounds of butter and 16½ pounds of cheese.
1 meter = 39.37 inches.

Result of competitive trial of cows of various breeds on the model farm of a landed proprietor in Holstein.

No. of cows.	Name of breed.	Total yield of milk during the year of trial.	Average yield of each.	Average per day of each.	Average yield.	
					Highest.	Lowest.
		Quarts.	*Quarts.*	*Quarts.*	*Quarts.*	*Quarts.*
3	Oldenburg (from Breitenburg)	8,594	2,865	8	2,940	2,820
4	Oldenburg (from Tondern)	9,337	2,334	6½	2,345	2,020
3	Ayrshire	5,886	1,708	5	2,249	1,415
4	Dutch	14,200	3,550	9¾	6,142	2,562
3	Swiss (from Simmenthal)	11,040	3,680	7⅛	.....	.....
3	Bavarian (from Bayreuth)	11,724	3,908	8	.....	.....

PRUSSIAN PRIZE CATTLE.

I am unable to give the number of different breeds of cattle in Germany, or even in Prussia, or the percentage of cattle belonging to each breed.



POMERANIAN PRIZE BULL "BLONDIN"

STATISTICS OF VARIOUS BREEDS.

Statements respecting their herds which I have obtained from several stock-breeders have enabled me to compile the following tables:

Statistics showing results of a five-years' trial of Frisian, Schleswig, and Silesian cattle on a stock-farm in Saxony.

Year.	Schleswig cows.			Frisian cows.			Silesian cows.		
	Average annual yield of milk.	Yield calculated to result from 1 cwt. of hay or its equivalent.		Average annual yield of milk.	Yield calculated to result from 1 cwt. of hay or its equivalent.		Average annual yield of milk.	Yield as calculated to result from 1 cwt. of hay or its equivalent.	
		Milk.	Butter.		Milk.	Butter.		Milk.	Butter.
	Quarts.	*Quarts.*	*Pounds.*	*Quarts.*	*Quarts.*	*Pounds.*	*Quarts.*	*Quarts.*	*Pounds.*
1877	2,932	29	2¼	3,272	27	2	2,212	22	1¾
1878	3,044	30	2¼	3,267	27	1¾	2,411	24	1¾
1879	2,856	28	2¼	2,903	24½	1¾	2,018	20	1½
1880	2,810	28	2	2,676	21	1	2,303	23	1¾
1881	3,050	30	2¼	3,132	26	1¾	2,635	26	1¾

Statistics compiled from examination of various specimens of cattle from several farms in Prussia.

Cattle of Swiss origin.	Length.	Height—		Live weight.
		To withers.	To rump.	
	Meters.	*Meters.*	*Meters.*	*Pounds.*
Steer, 2½ years	2.60	1.51	1.51	1,315
Cow, 7½ years	2.69	.....	.....	1,281
Cow, 5 years	2.48	1.37	1.42	1,085
Cow, 8 years	2.59	1.42	1.43	1,233
Cow, 7 years	2.67	1.50	1.56	1,335

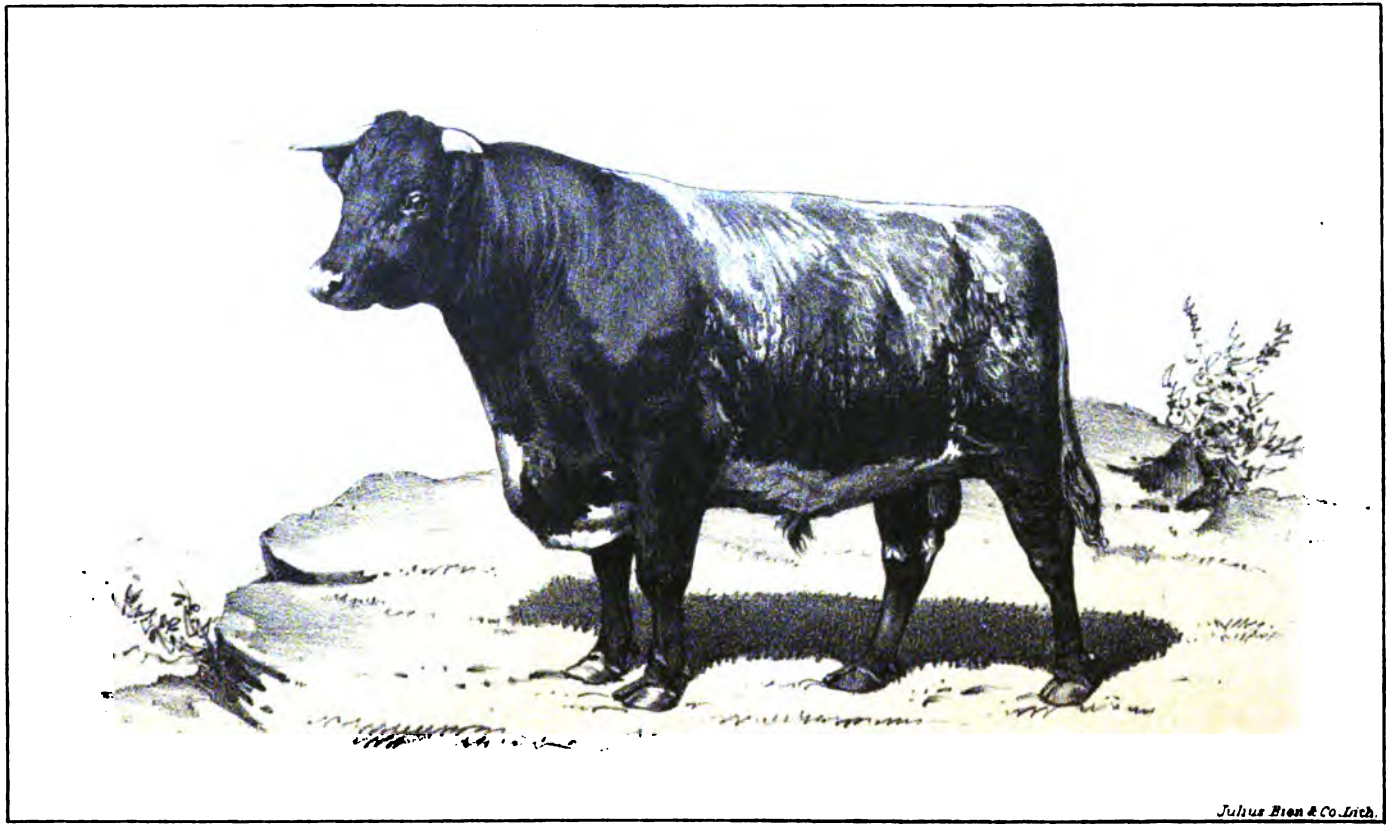
Annual average yield of milk, &c.: 2,500 quarts, of which 100 quarts averaged 8 pounds of butter and 16½ pounds of cheese.
1 meter = 39.37 inches.

Result of competitive trial of cows of various breeds on the model farm of a landed proprietor in Holstein.

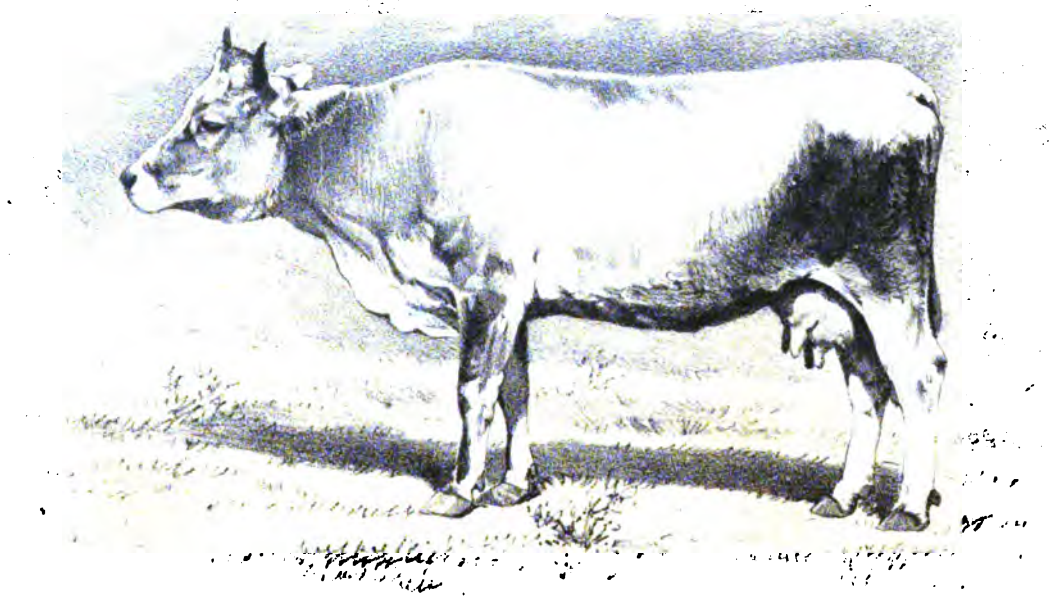
No. of cows.	Name of breed.	Total yield of milk during the year of trial.	Average yield of each.	Average per day of each.	Average yield.	
					Highest.	Lowest.
		Quarts.	*Quarts.*	*Quarts.*	*Quarts.*	*Quarts.*
3	Oldenburg (from Breitenberg)	8,594	2,865	8	2,946	2,820
4	Oldenburg (from Tondern)	9,337	2,334	6½	2,345	2,020
3	Ayrshire	5,886	1,708	5	2,249	1,415
4	Dutch	14,200	3,550	9¾	6,142	2,562
3	Swiss (from Simmenthal)	11,040	3,680	7½	.....	.....
3	Bavarian (from Bayreuth)	11,721	3,908	8	.....	.....

PRUSSIAN PRIZE CATTLE.

I am unable to give the number of different breeds of cattle in Germany, or even in Prussia, or the percentage of cattle belonging to each breed.

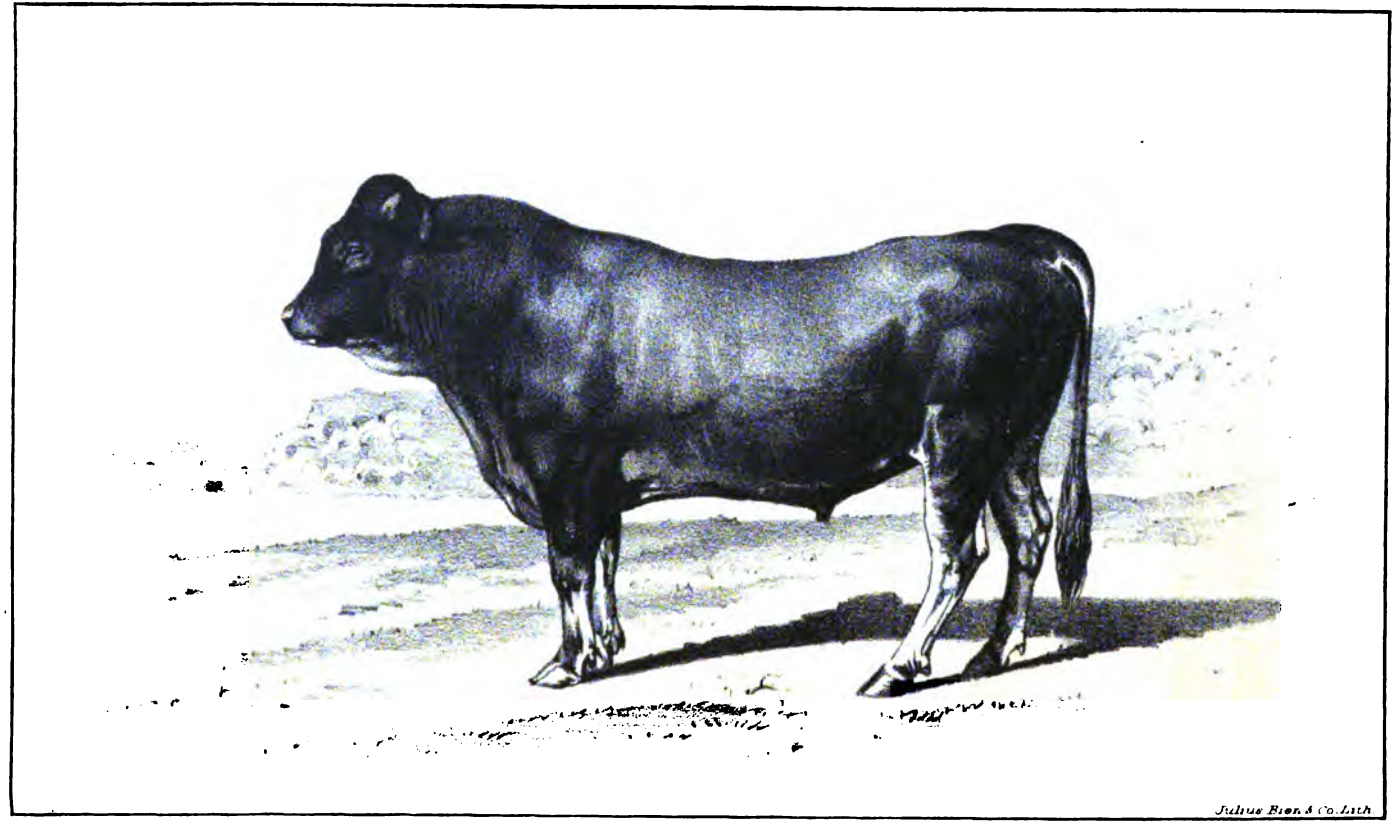


POMERANIAN PRIZE BULL "BLONDIN"



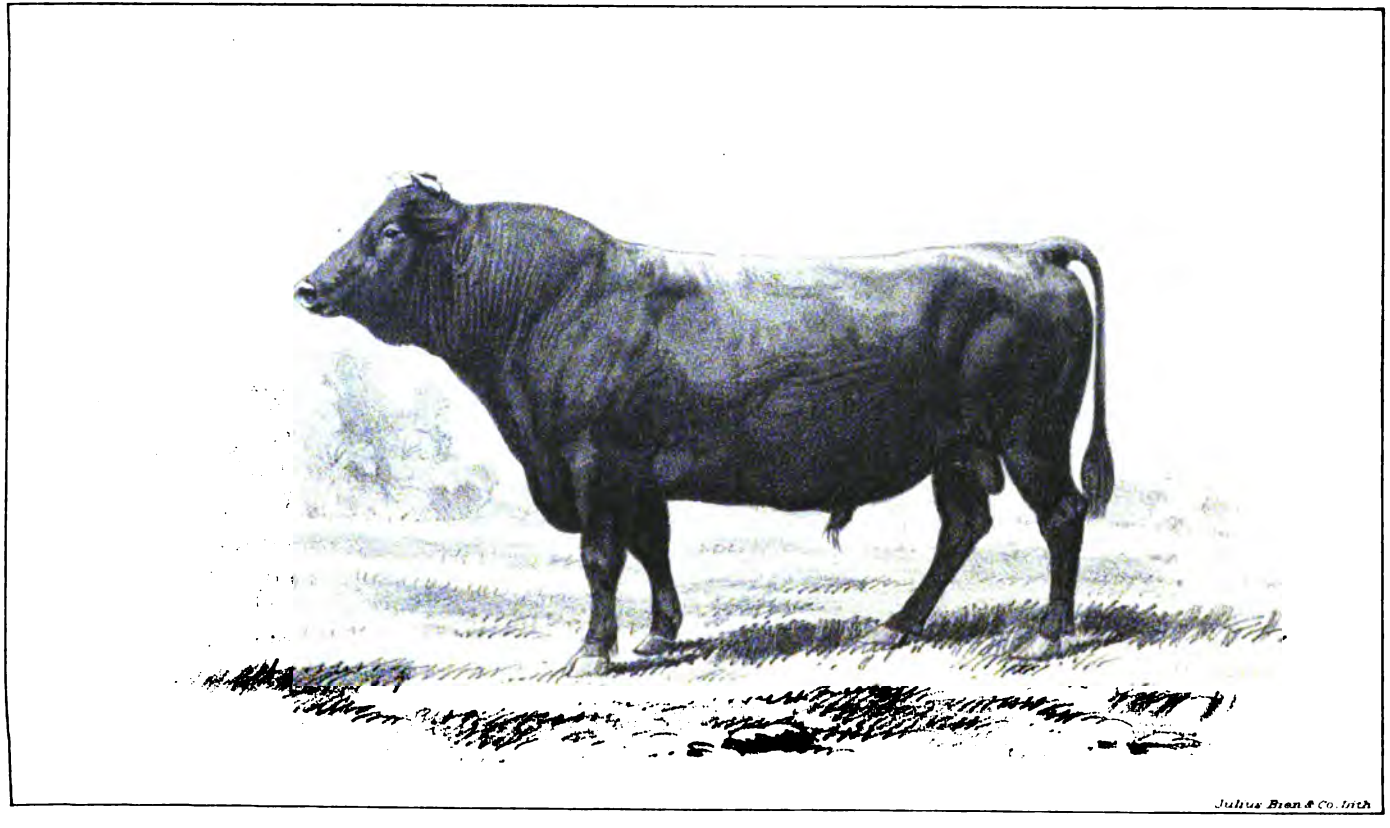
Julius Bien & Co. Lith.

BAVARIAN PRIZE COW



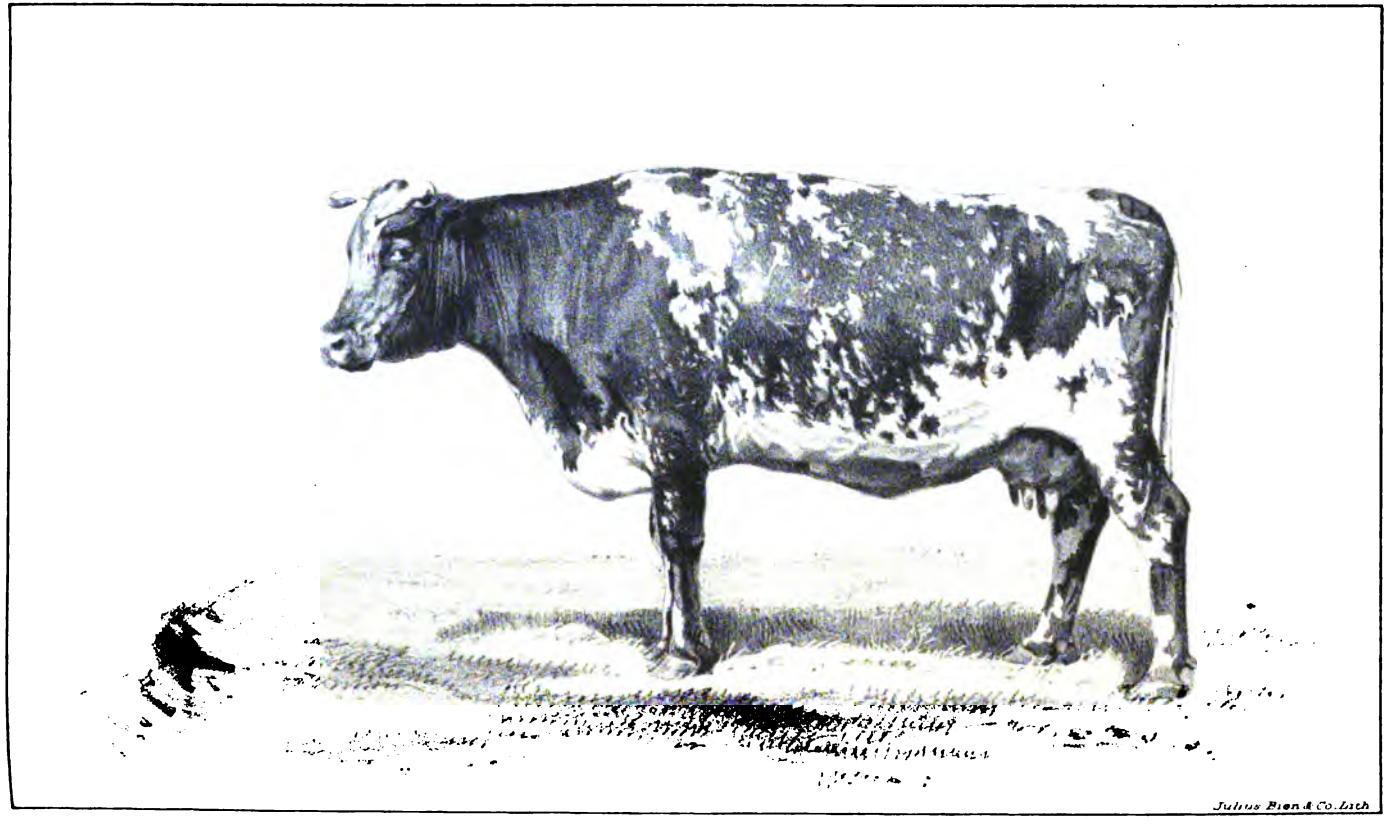
BAVARIAN PRIZE BULL

ANGELER PRIZE COW

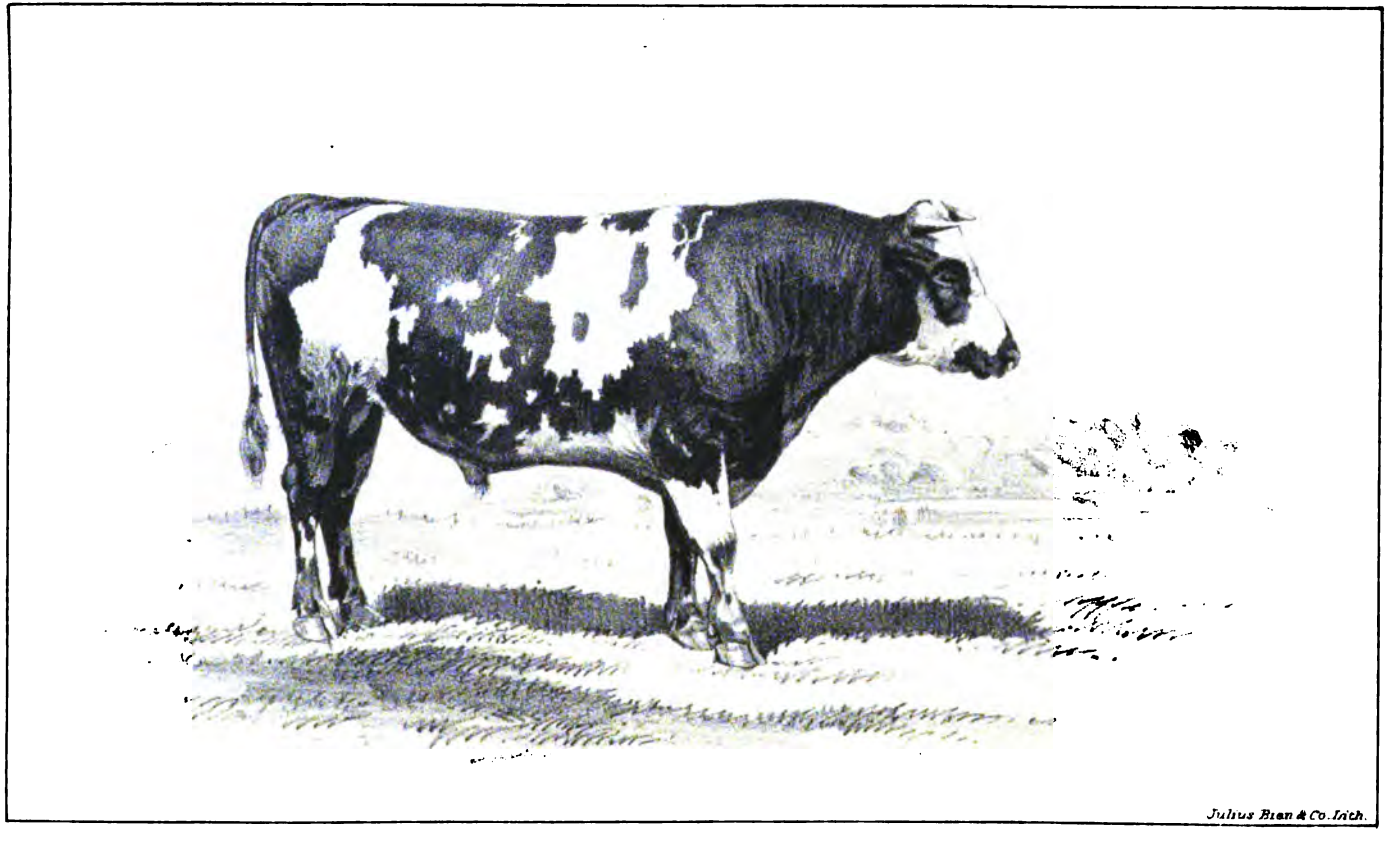


ANGELER PRIZE BULL "THOMAS"

BREITENBURG PRIZE BULL "CONRAD"



WILSTERMARSCH PRIZE COW "LEANDA"



WILSTERMARSCH PRIZE BULL "NEPTUNE"

I am informed that at the agricultural department here a census has been taken during the present year by which this information will be given, but as the report has not yet been made public the department declines to supply me with the required information. From my own investigation I am led to believe that the different breeds of cattle in Germany have not been kept as separate and pure as in our own country, but have been so crossed that but comparatively few herds remain in their original purity.

But comparatively few cattle are raised in the immediate neighborhood of this city, as the province of Brandenburg, in which Berlin is situated, is not well adapted for grazing purposes, the surface being level and the soil light and sandy.

Exhibits A,* hereto annexed, are photographs of an East Frisian bull and cow; Exhibits B,* of an Oldenburg bull and cow; Exhibits C, of a Wilstermarsch bull and cow; Exhibits D, of a Breitenburg bull; Exhibits E, of an Angeln bull and cow; Exhibits F, of a Bavarian bull and cow; and Exhibit G, of a Pomeranian bull.

These cattle were all exhibited and received prizes at the late Hamburg Exhibition.

M. S. BREWER,
Consul-General.

UNITED STATES CONSULATE-GENERAL,
Berlin, December 27, 1883.

CATTLE IN OLDENBURG, JEVERLAND, AND EAST FRIESLAND.

REPORT BY CONSUL WILSON, OF BREMEN.

INTRODUCTORY.

In answer to circular letter under date of July 18, 1883, desiring certain information regarding the breeding and raising of cattle in this consular district, I have the honor to submit the following report:

This industry is principally carried on in the Duchy of Oldenburg, Jeverland, and East Friesland, and is the chief employment of the farmers. Cattle raised in other parts of this consular district are similar to the Oldenburg or Budjadinger breed, but not of such pure blood.

I am indebted to Mr. John G. Gross, consular agent for the Grand Duchy of Oldenburg, Jeverland, and East Friesland, for the following valuable information, obtained by him by visiting various parts of his agency and the farms of the principal breeders and raisers of this justly celebrated breed of cattle, and conversing with them and with the public officials who are interested in this business.

SOIL AND CLIMATE.

Before entering into particulars concerning the breeding of cattle in the Duchy of Oldenburg, Jeverland, and East Friesland it is necessary to give a general description of the soil and climate of this district, which contains about 8,395 square kilometers, with about 530,000 inhabitants.

The soil must be divided in two parts, each entirely different from the other. One part is called the marsh or marshes, and stretches along

* See report by Consul Wilson, of Bremen, for duplicates of Exhibits A and B—an East Frisian bull and cow and an Oldenburg bull and cow.

the coast of the North Sea from Holland to Schleswig-Holstein, and is formed by the deposits of the sea and the different rivers flowing into it. The other part is called the Geest or Geestland, composed of sand and bog of a very light nature. The cattle bred on this soil, of course, are of a lighter nature, but nevertheless good milkers, as is shown hereafter.

The marsh-land may be divided into three different regions, viz:

(*a*) The region of the alluvium outside of the dikes or dams, which is more exposed and is overflowed by high tides.

(*b*) The region of the old pastures, grazing land, and that used for tillage, all of which are protected by high dikes or dams against high tides.

(*c*) The region of the mixed marsh-land, that is to say, clayish sand, the transition from heavy clay to lighter soil.

It is natural, therefore, that the quality of the soil in the marshes must be a very different, and that with the change of the soil the weight of the cattle corresponds, while beauty of the form depends less on the nature of the soil, but more or less, if not entirely, upon the intelligence of the breeders.

The Geestland is diluvium and consists of a light sandy soil peculiar to the plains of North Germany, in which sand, bog, or moor prevails; in some places loam covers the soil, which in general is greatly in want of lime, as without it or good marl the cultivation of the better or more profitable sorts of herbages for fodder is very limited, and for this reason the breeding of heavy cattle is limited in the same manner. While the marsh is entirely cultivated, only 60 per cent. of the Geestland is cultivated, the rest being barren or uncultivated heather or bog.

TILLAGE AND GRAZING LANDS.

The following table will show how the farmers in the Duchy of Oldenburg make use of their land; also in what manner cattle-breeding is dependent on the quality of the different soils:

Territory or soil.	In use for tillage and gardeners.	For pastures.	For mowing purposes.	Total area in use.
	*Hectares.**	*Hectares.*	*Hectares.*	*Hectares.*
Marsh	31,180	46,750	25,115	103,045
Geestland	101,402	23,077	37,920	162,399
Total	132,582	69,827	63,035	265,444

* 1 hectare = 2.471 acres.

Number of cattle.

Territory or soil.	Total number—				Number of cattle on every 100 hectares of area.			
	Horses.	Cattle.	Pigs.	Sheep.	Horses.	Cattle.	Pigs.	Sheep.
Marsh	12,920	79,655	12,768	18,880	12.500	77.09	12.306	18.202
Geestland	15,638	94,128	67,487	130,118	9.206	55.704	39.406	77.05
Total	28,558	173,783	80,255	148,948	.....	.....	.....	.....

The preponderance of cattle-breeding in the marshland is evident, and the quality of the race for milking, breeding, and slaughtering purposes so far exceeds the races in the Geestlands that it is not necessary to enter into more particular details than is shown in the annexed tables of these latter races, they being of too inferior quality to improve the breed in the United States.

According to a statement made by the director of the statistical department at Oldenburg, the comparative value of the cattle raised in the Weser marshes, classed in the three groups hereinbefore mentioned, may be stated to amount per metric square mile of cultivated land for Class A, from $37,750 to $45,000; Class B, from $30,000 to $37,750; Class C, from $22,500 to $30,000; whilst the value of the cattle raised on the Geestlands amount only for first class land, from $18,500 to $22,000; for second class land, from $14,500 to $18,000 for third class land, from $7,000 to $12,000 or 14,000 per metric square mile.

The better the soil the larger is the number of horses and cattle kept thereon in the marshes, whilst in the Geestlands sheep are prominent, next agriculture and peat digging.

Nearly all farmers in the marshes are proprietors of the land they use; nameable nobility, abounding in other parts of Germany, does not exist there, therefore larger estates than from 8 to 40 hectares in the marshes and from 15 to 60 hectares in the Geestlands are but seldom met with.

CATTLE AND CATTLE-BREEDING IN THE MARSHES.

The foregoing appears necessary to the understanding of the following:

For the promotion of cattle-breeding in the district of the marshes several institutions have been established; the principal are:

(1) The selection of bulls for covering purposes by delegates of the interested farmers, veterinary surgeons, and some Government officials.

(2) The institution of the herd-book, keeping a pedigree of bulls and cows selected for registry.

(3) The different cattle shows.

Selection of bulls.—I have to remark that only such bulls may be used for covering purposes as have been selected by this commission, which, in general, is appointed by breeders and graziers in every district of the public administration. For the best bulls premiums are granted by the Government amounting to from $50 to $75 per head, according to the form and the breed. This system, in general, enjoys the approval of the farmers and breeders, as it guarantees that their cows are only to be covered by well-formed and well-conditioned bulls.

Herd-books.—The institution of the herd-book, although introduced here only a few years ago, has served greatly to improve the breed of the cattle; the register it contains gives the breeders a clear insight into what effect they may obtain in strict pure breeding of selected cattle. The first section of the statutes point out the exact aim which the breeding has to obtain; therefore the different animals are selected by a commission which may in no instance deviate from this rule. The institution of the herd-book has only been in use here for five years; in East Friesland it is to be introduced soon. In the marshes of the duchy were registered 1,195 head of cattle; in the Geestlands, 819; total, 2,014 head.

Cattle shows.—This institution, imported from England, meets here with great approbation, and has developed itself since 1836 (when the first cattle show was held near Brake) very favorably, so that now in nearly every district of the marshes annual cattle shows take place, which serve greatly to improve, by comparing the result of the different breeds, and the manner of breeding in the different districts.

The cattle in the duchy and East Friesland may be divided into—

(*a*) Cattle raised on the marshes of the river Weser.
(*b*) Those raised raised in Jeverland.
(*c*) Those raised in East Friesland.
(*d*) Those raised in Geestlands.

(*a*) The marshes on the river Weser embrace the district of Brake, Budjadingen, and Elsfleth, bounded on the north and northeast by the North Sea, on the east by the river Weser, and on the west by the river Jade. The cattle raised in these districts are called in the interior the Oldenburg or Budjadinger race, and are in great demand for breeding purposes nearly everywhere. Although the cattle are more or less related to the races raised in Holland and East Friesland, they possess distinct marks which characterize their origin. The head, for example, does not agree with the Holland breed; the forehead, the cheeks, and the parts of the mouth are broader, and the head is shorter; the mouth shows a dark, but not black pigment; the palate roof of the mouth shows the same; the horns of most animals are short with an outward curve, and sometimes on young animals are rather strongly developed; the formation of the forepart of the body shows also a difference with the Holland breed, falsely called in the United States the Holstein breed.

Whilst the pure Holland breed shows a back view which promise good milkers, the breeders thereof appear to have overlooked the development of the fore parts, whereas the cattle in the marshes show a wide and deep breast, well formed, close shoulders and broad withers, with ribs, which, since the introduction of the herd-book, take more and more the round barrel-form; the backbone appears long to satisfaction, and shows in its construction good formation of kidneys and hips, and very seldom now shows an inclination of curving downwards (hollow back); the croup or hind quarter between the hips corresponds with type peculiar to the cattle of the marshes, but sometimes might be longer; by careful breeding the root of the tail has greatly improved in its situation; formerly showing a more or less tendency to be prominent, it now hardly raises above the straight backbone line; the shanks of a good cow of the marshes present themselves full fleshed, and the flesh between the shanks sinks sufficiently deep.

The fat cattle in the Weser marshes never prove delusive in their weight, in general they deliver larger weight than they promise while living. The udder and milk-tokens are in most all cases well developed, and are never known to deceive; wherefore the cow of the marshes may be put down as a good milker, the particulars of which will be shown in the table annexed.

The district in which the Jeverland race is bred embraces the district of Jeverland on the left bank of the river Jade; its boundaries are: on the north, the North Sea; on the west, East Friesland; on the south, the district of Varel; and on the east, the river Jade. The cattle produce of this district embraces dairy products, rearing calves for breeding purposes, and fattening for slaughtering. In their whole appearance these cattle show in a much larger degree than the Budjadinger cattle their near relation to the cattle raised in the north part of Holland. The

head, in proportion to its breadth, is somewhat longer; the pigment of the mouth in general of black color; the horns are fine and of a cylindrical form; the form of the neck corresponds with the form in the other marshes. The expansion of the breast, and the firmness of the shoulders, however, do not reach that of the cattle in the Weser marsh. The form of the ribs is more flat; nevertheless the total impression of the fore parts of the trunk or body is satisfying, showing that breeders know what they aim at; the hind quarter in all its parts is well developed; a trifling curving or sinking of the backbone before the croup is sometimes met with as well as a faulty elevation or situation of the root of the tail; the color is, in general, with only a few exceptions, black and white, four white legs, the tail half black and white, with a small white star on the forehead; the eyelids and the exterior part of ears are black. The milk-tokens must be called excellent. This race boasts of a fine skeleton, fine skin and hair, but in general it is not so heavy as the race raised in Holstein. The Jeverland race may be called excellent milkers, easily fed, with corresponding capability to be fattened. The aim of the breeders here in general is to get good milkers.

The East Frisian race is reared solely in the district of the Landdrostey, or county of Aurich, which is bound on the north, as are all the marshes, by the North Sea, on the west by North Holland, on the east by Jeverland, and on the south by the district of the Landdrostey, Osnabruck. This country contains only on the sides of the sea and rivers the marshland mentioned before, whilst the land lying more in the interior consists of bog and sand.

I only mention here the cattle produce of the marshes, as those on the bog and sand lands are too small and insignificant to be mentioned in this report. The production of cattle in the marshes embraces, as in Jeverland, about 75 per cent. for breeding purposes, and about 25 per cent. for the dairy. The latter are kept mostly to raise the calves, which are in general sold when one year old to the interior of Germany—to Saxony, Frankfort, and the southeast part of Prussia, at very good prices. The form of the animals is not so finely shaped as those in the Weser marshes and Jeverland, although in their appearances they show the greatest resemblance to the Holland and Jeverland races. The color of the cattle is about 80 per cent. black and white, and about 20 per cent. red. The first-named color is preferred, because its sale is more certain; the latter color is kept more for home use. A few months ago the institution of the herd-book was introduced. It does not, however, find the same approbation as in the Weser marshes. The breeders, however, try to improve their cattle by importing bulls from the north of Holland, in which it appears they succeed very well. The number of cattle raised in this part, that is to say, on the marshes, amounted, horses, sheep, and pigs included, as follows:

Date.	Horses.	Cattle.	Sheep.	Pigs.
1822	25,943	102,559	49,401	25,807
December 3, 1867	28,918	129,935	81,143	27,778
January 10, 1873	24,032	131,048	67,968	17,079
January 10, 1883	25,600	125,785	54,397	31,207

This enumeration shows clearly that the farmers did not keep pace with their neighbors in Holland and Oldenburg; that, on the contrary, they have lost ground in their competition with those breeders who summon their whole energy to improve their cattle in the manner

wanted by breeders and buyers of the interior of Germany, the United States, Italy, and France, who in many instances pay prices double the amount that may be obtained in the ordinary way of disposing of the overproduce.

The cattle raised in the Geestland are, as before stated, not of any consequence for breeding purposes. In stature they are small, or rather insignificant, although it is not to be denied that they possess good milking qualities. Breeders exert themselves to improve their cattle by importing bulls from the province of Drenthe, in Holland, and it is stated that the result obtained by the cross-breeding has been very satisfactory, although the lightness and sterility of the soil do not assist them in producing such cattle as their endeavors deserve.

SUPERIORITY OF THE OLDENBURG CATTLE FOR EXPORT.

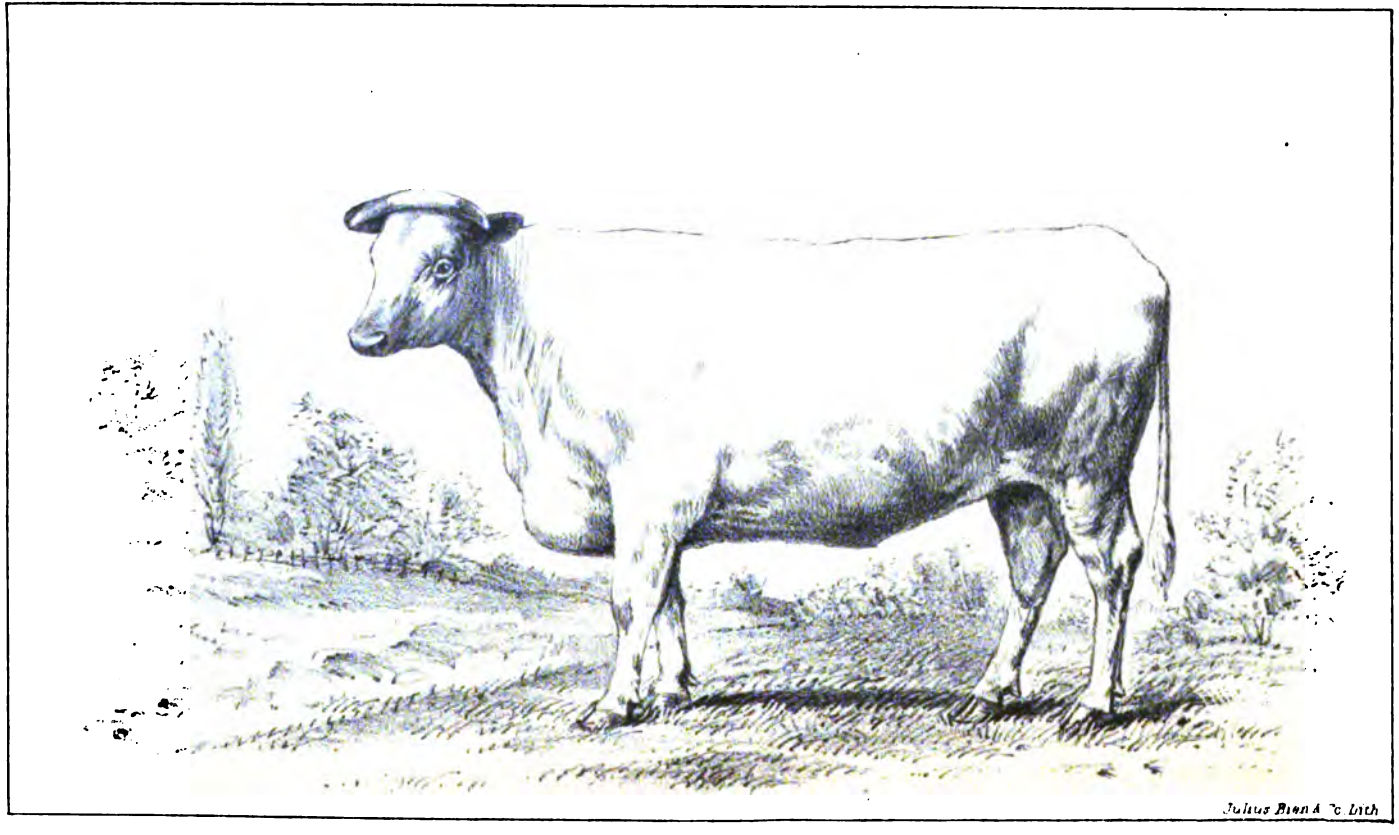
For exportation to the United States, the Oldenburg cattle raised on the Weser marshes must be put down as one of the best qualified races. To all parts of Europe, to the south of Germany, Prussia, east and west, Russia, Galicia, and even to the Sandwich Islands, these cattle have been exported. To Galicia last year there were exported thirty-eight head of exquisite registered cattle, destined to serve there as the commencement of breeding this race pure. Those cattle were bought here by a commission of the Royal Agricultural Society, at Lemberg. For this year the exportation, including the number bought by this commission and private estate holders, not obtainable, is said to be still larger. For several years the cross-breeding with the Shorthorn race was more prominent here, but since the laws of Great Britain prohibited the exportation of live cattle to the English ports, the farmers have relaxed in favoring this race, and returned to the pure Oldenburg breed, much to their own satisfaction and profit.

PRODUCT AND EXPORT OF MARSH CATTLE.

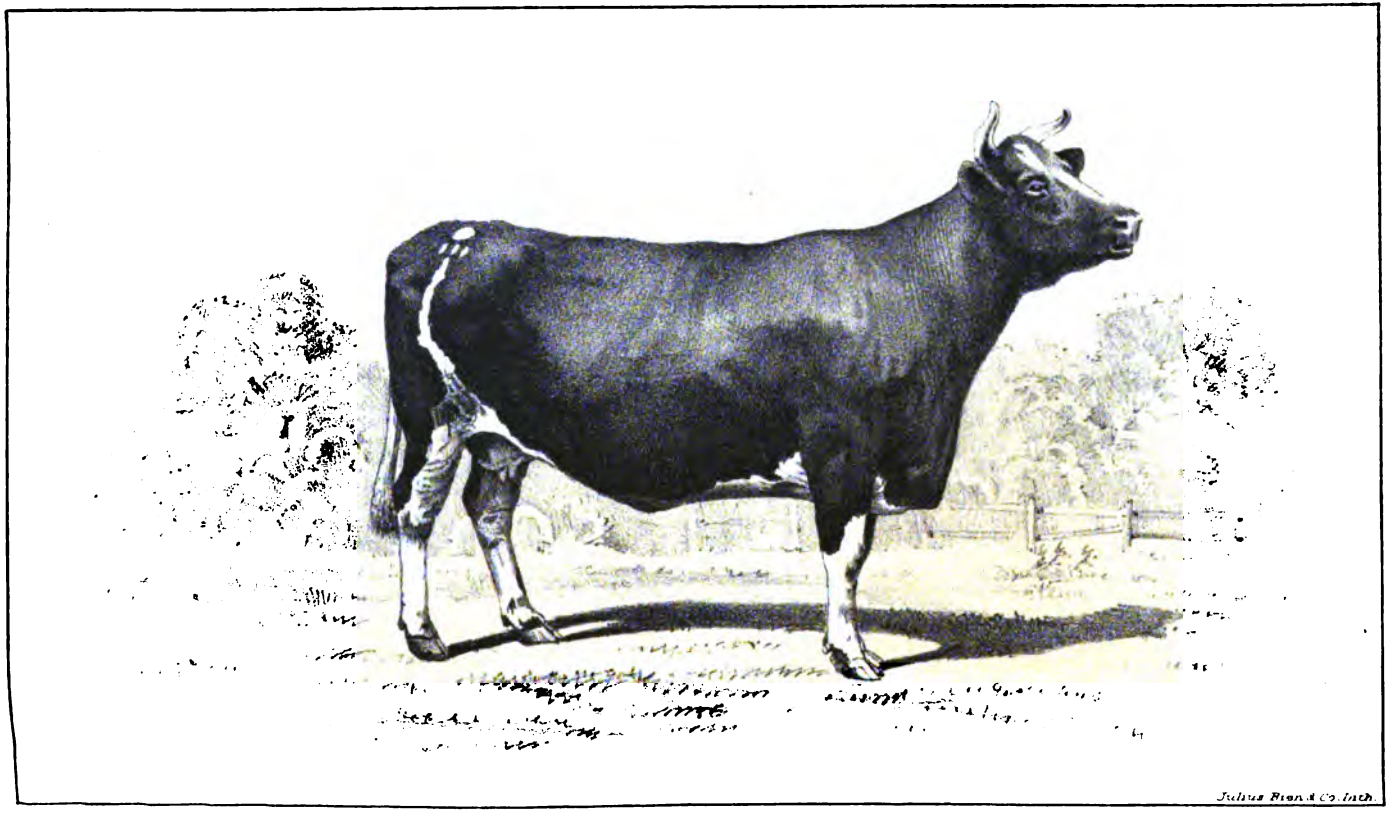
To compare the production and export in the Weser marshes I repeat here the result of the census taken thereof on the 10th of January, 1883. This census was taken at a very unfavorable time, when all salable beasts had been disposed of and the new production had not refilled the place:

District.	Cattle counted on January 10, 1883.	Number of cattle exported to different countries in Europe.
In the Weser marsh	79,448	22,984
In the Geestlands	94,108	6,183
Total	173,556	29,167

In the present year the demand for cattle for breeding purposes has been more active, in consequence of which the stock of first rate cattle is rather low and prices rule higher than before. Last year the medium price for non-registered bulls of one and a half to two years was $100 to $125; for elder animals of this sex, $150. Cows, delivered from two to four calves, cost $100 to $125. Heifers, according to quality, $100 to $225. Bull calves, $60. Cow calves, $45 to $55. For registered cattle

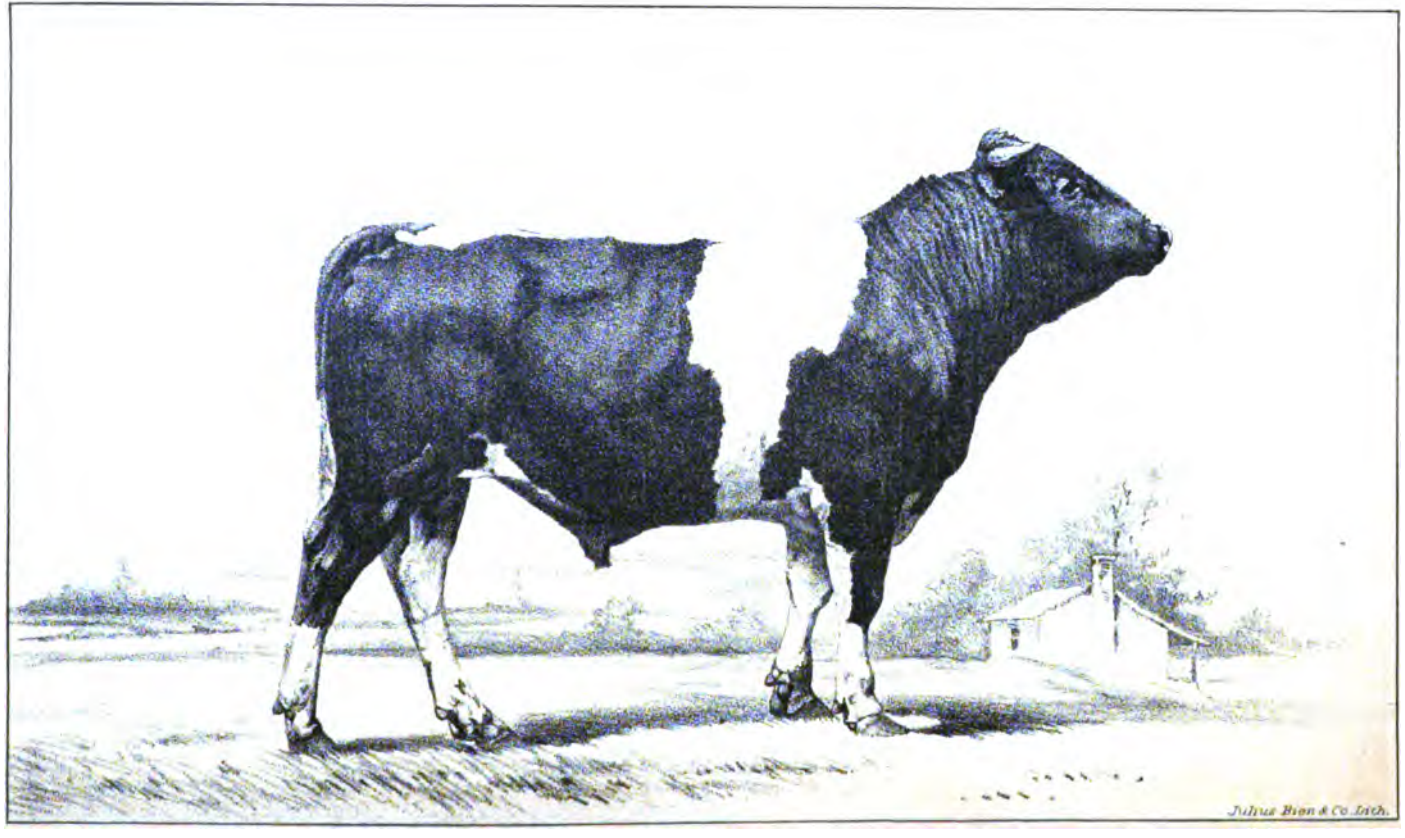


PRIZE SHORTHORN COW "ALICE"



Julius Bien & Co. lith.

OLDENBURG PRIZE COW "ALLMUTH"



OLDENBURG PRIZE BULL

the prices were remarkably higher, from 10 to 50 per cent., according to their descent and quality. Purchasers must be very careful in buying the pure-bred Oldenburg cattle. Many a head of cattle passes for the pure Oldenburg race, as the Holstein cattle from Holland, which never saw Oldenburg nor Holstein.

EXPORT OF CATTLE TO THE UNITED STATES.

As to the best way of transporting cattle to the United States, this is done by the way of Brake-Nordenham to Bremerhaven, thence by steam to New York, Baltimore, or New Orleans. The freight for a full-grown beast will amount to about $30 to $36, in the common way of shipping. The cost for transport and maintenance whilst on the voyage would amount to about $5 to $10 per head, including feeding and waiting on board. This cannot, however, be exactly stated, as much depends on the number of animals sent. If many are to be sent, then a waiter is necessary, who would cost, passage going and coming included, about $100, more or less, according to the accommodation required. The same amount to ship by way of Hamburgh, or by way of Amsterdam or Rotterdam for cattle from East Friesland.

PORTRAITS OF OLDENBURG AND EAST FRISIAN CATTLE.

In order to compare the cattle bred in the marshes with other animals bred in Holland, France, and England, I transmit herewith several photographs of the Oldenburg and East Frisian race, prize cattle at the agricultural fair at Hamburg this year.

No. 1 of the accompanying photographs represents an Oldenburg bull of rather the old style, short and rather clumsy in bones. He does not answer the requirements of the herd-book union. The formation of the head and neck is coarse and fails in beauty. The parts of the shoulders and the formation of the ribs certainly are well developed, but the root of the tail lies too high; the hind quarters are hardly satisfying; the formation of the flesh near the ankle-bones or spring-joints is not full enough. The animal shows crooked hind legs, although the ankle-bones are normal. The animal is too short, and the line of the back answers but imperfectly the requirement of the herd-book union. The animal shows but few good milk-tokens, but more the signs of being easily fattened. He was raised on an estate between Brake and Oldenburg, on a mixed soil. His color is black and white, with a white star on the forehead.

No. 2 of the accompanying photographs is a cow of the pure Oldenburg breed. Owing to the unlucky position in which the waiter kept her head, she does not represent herself so favorably as might be wished. This is much to be regretted, as the picture does not give a good idea of the form of the beast, which is one of the best sort, with a very straight-lined backbone. Finer hip-joints or thighs are seldom met with. The ankle, leg-bones, and spring-joints are normal, and for her race she has a very fine head and breast; the depth of the latter is such as formerly was seldom met with. The form of the shoulders, ribs, hips, hind quarters, and thighs are such as is required by the herd-book union. The milk-tokens are very good and do not deceive. Her color is black and white, with white star on the forehead.

No. 3, a full-blooded Shorthorn cow about four years old. This animal was bred in the vicinity of Brake, and answers in form, &c., those demands which are required of this race. She was, at the time of the

Hamburg exhibition, rather overfed. Head, collar, and shoulder-blades are very good, as well as the back, hips, and hind quarters. Nevertheless, the breeders in the marshes, with only a single exception, do not approve of this race. The extreme formation of fat at the root of the tail is not desired in the interior. For that reason the Oldenburg race is preferred. The thighs of the animal are highly developed, as well as the form of the breast, together with slender horn and bone formation. The standing of the hind legs is good, with normal ankle-bones or spring-joints. This animal is easily fattened, but the milk-tokens leave something to wish for. To this animal a first prize was awarded at the exhibition at Hamburg. The picture has the same fault as the others. The waiter, as well as the photographer, did not know what they were about; otherwise the head of the cow would not have been held as represented, the backbone receiving thereby an appearance as if it was not straight-lined. Color is white and brownish red.

No. 4 of the photographs is a prominent bull of the Oldenburg or Budjadinger race. The picture does not do justice in this case. The animal's head is kept far too high and out of place by its waiter, through which the backbone does not show the straight line it really possesses by nature. The standing of the hind legs is a normal one, the form of the thighs perfect, as also the form of the breast. The form of the head answers the original Oldenburg type; shoulders, back, hips, and the form of the hind quarters or croup are good, whereas the ribs might have been of a more round or barrel form. In general the cows of this breed combine good milking with fattening qualities. Color black and white, white legs, with white star on forehead.

No. 5 of the accompanying photographs represents a heifer about three and a half years old, by Magnate, out of an Oldenburg cow, pure Oldenburg breed. The form of the neck and head scarcely answers the requirements of the herd-book union. The neck is short and thick; head rather full and heavy; back and form of ribs good, as also the form of the hips and of the hind quarters or croup; the thighs are satisfactory, but the breast is too much trussed up. The ankles or spring-joints are good, whereas the breast might have been a little deeper and finer; the signs of easy fattening are more prominent than those of milk. Color white and black, with blase on the forehead.

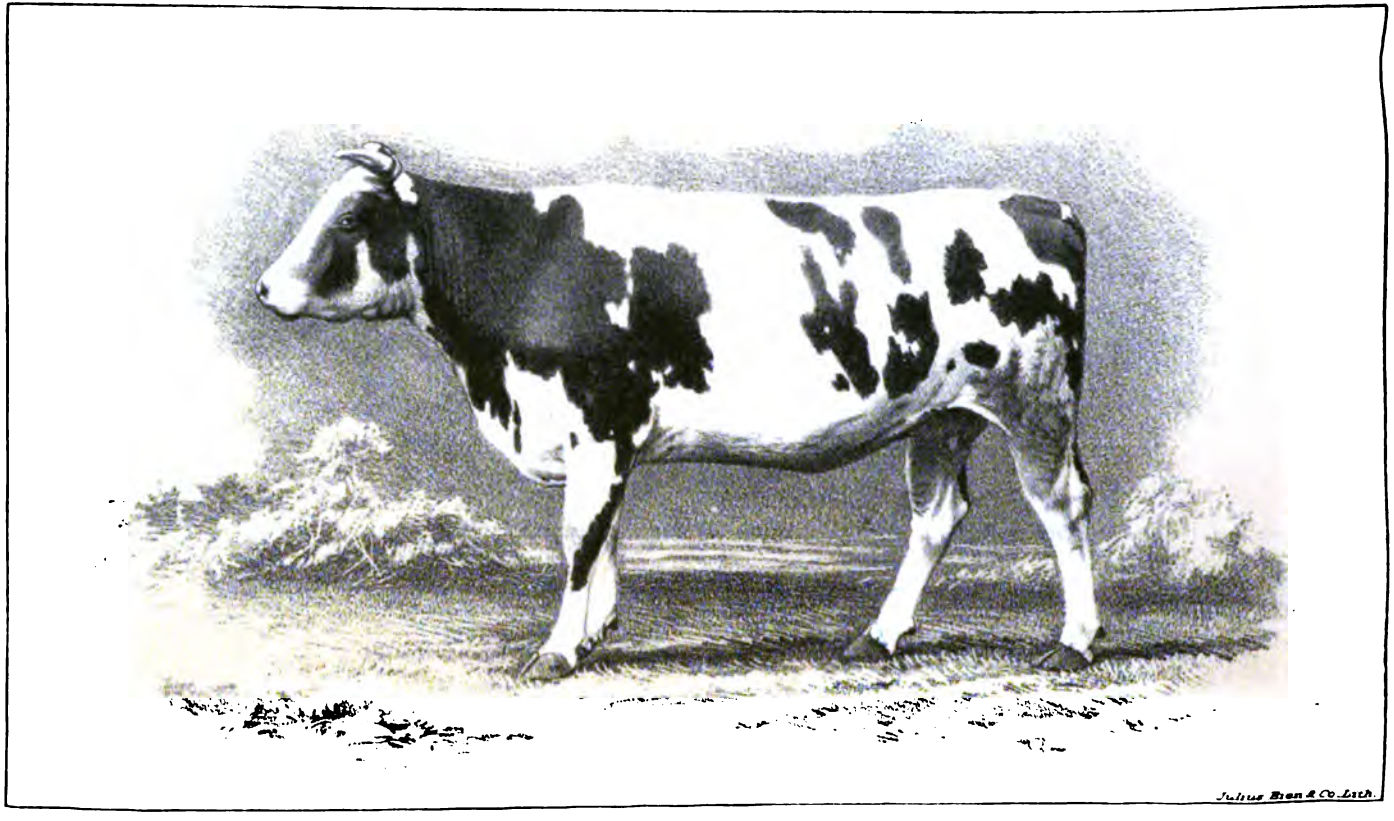
No. 6 represents a bull of the East Frisian race, three years old, born near Jemgum, East Friesland; is a good specimen of its race. Shows, by the unlucky position in which the head is kept, a slight downward curving in the backbone, which in nature is not the case; the animal otherwise presents itself favorably, and its offspring, according to the statement of its owner, are renowned for being fed fat and showing good milk-tokens. Color black and white, four white legs, and a blase on the forehead.

No. 7 of the accompanying photographs, a Polled Angus bull, imported from England, is kept on an estate in the south of Holstein. The farmers in the marsh do not approve of this race, wherefore its introduction here, though tried several times, did not succeed. The picture shows the bull very favorably, but also shows far too many corners on the fore part of the hind legs. The picture is mentioned here only to show the difference between the several races. Color black, with rather mouse-colored hind legs.

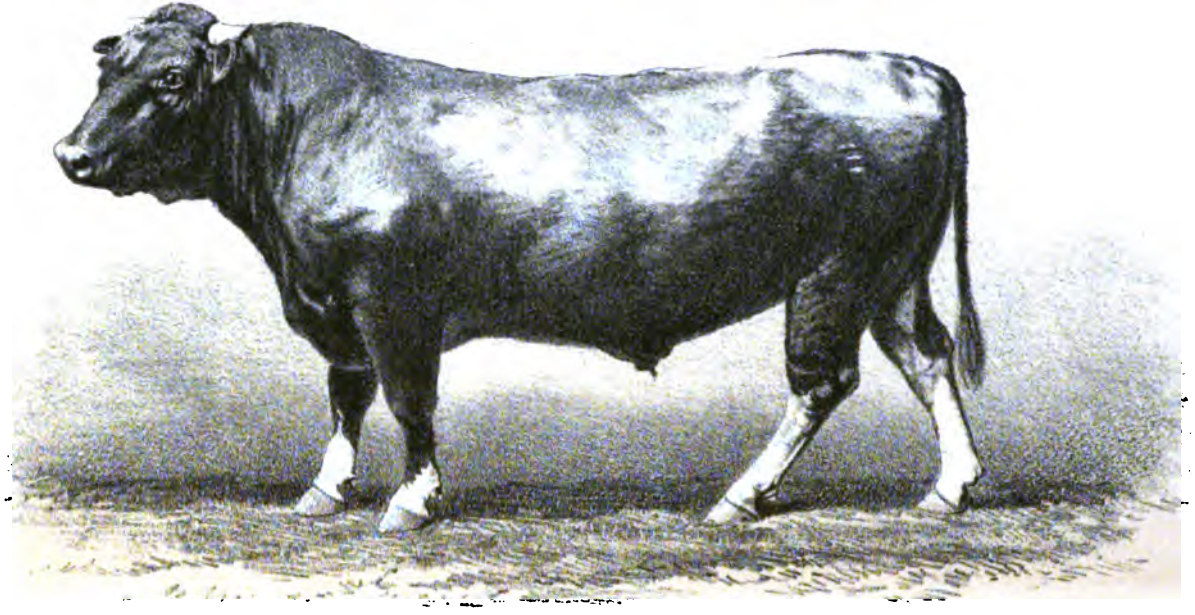
By the kindness of L. Vissering, esq., King's counselor of the agricultural department and president of the principal agricultural society of East Friesland, at Dornum, I am enabled to present the photographs of cattle bred in East Friesland, Nos. 8, 9, and 10, herewith.

Julius Bien & Co. Lith.

PRIZE OLDENBURG OR BUDAJINGER BULL.

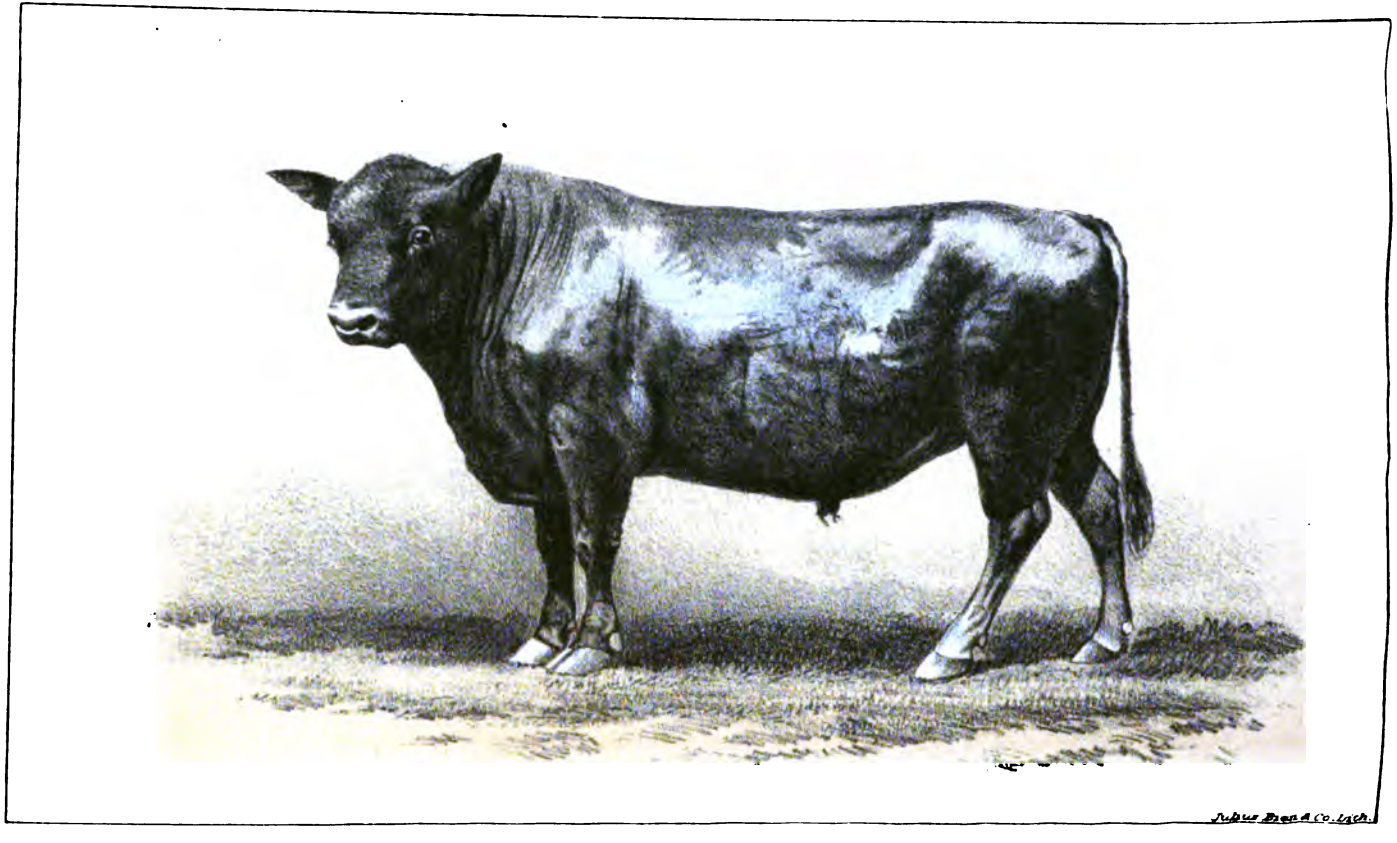


PRIZE OLDENBURG HEIFER

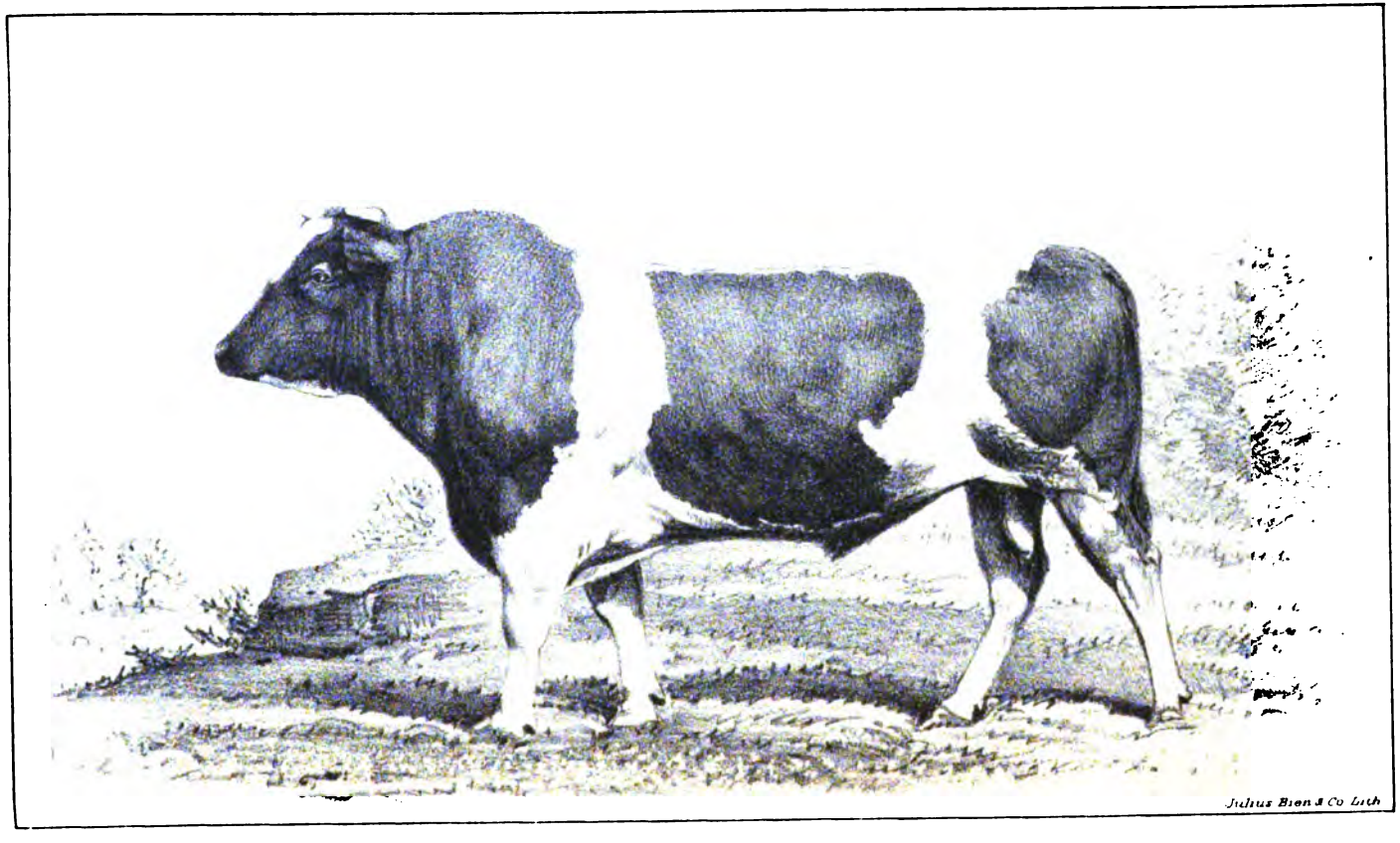


Julius Bien & Co Lith

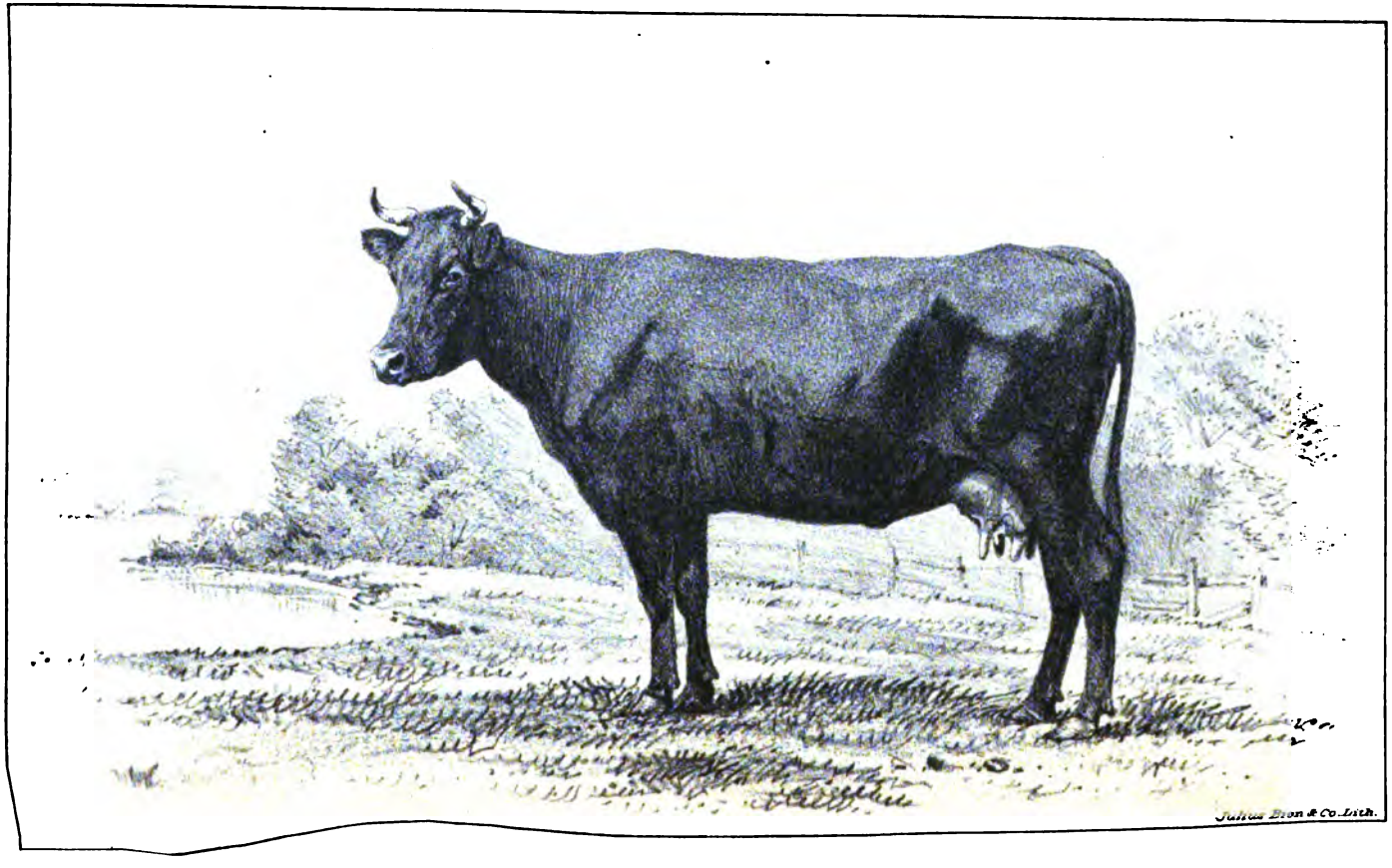
EAST FRISIAN PRIZE BULL.



POLLED ANGUS BULL.



AN EAST FRISIAN BULL



AN EAST FRISIAN COW

AN EAST FRISIAN COW

No. 8 is an East Frisian cow, representing one of the finest milk cows of the race. Color black and white, white blase, four white legs, tail half black, half white; is a first-rate milker, easily fed, and very enduring in all climates.

No. 9 is likewise an East Frisian cow, bred in that province, but now in the possession of a Mr. Peters, counselor of the agricultural department of Pomerania, is a very fine specimen of the red-colored race, said to be descended from the Anglian race. The animal is about seven years old, a very good milker, and very hardy. The best specimens of this race are raised in the district of Norden and Aurich.

No. 10 represents an East Frisian bull, now three and one-half years old, raised in East Friesland, now the property of the crown prince of the German Empire. The animal is a fair specimen, if not one of the fairest specimens, of his race, but shows rather heavy formation of bones, and is rather long-legged, with a slight downward curving in the backbone. The formation of the head is normal, but the root of the tail rather prominent. Color black and white, blase, white legs, and black tail. These cattle are very enduring and will stand a passage across the ocean as well as the Oldenburg or Budjadinger race.

HOUSING, FEEDING, AND BREEDING.

Herewith I close the descriptive part of the cattle raised in my district, to enter more particularly upon the housing, feeding, and breeding of the cattle, and the disposition made thereof.

The cattle in the marshes pass from six to seven months of the year in the open air on meadows, which give plenty of nourishing and wholesome food, by which the more or less spare winter-feeding is fully compensated. The pastures are abundant in grasses, but rather poor of plants or herbages. For seventeen milch cows, in general, 10 hectares, or 25 acres, are required of good middling marshlands. To show the increase of weight of cattle grazing on good pastures in the marshes the following statement was given me by a well-to-do farmer in this vicinity: From May to October, last year, this gentlemen fed, on meadows measuring 20.1993 hectares, or about 46 acres, forty-two oxen, sixteen sheep and calves, and one filly. For thirteen days the oxen were fed on meadows of which the grass had been cut before. The result of the feeding during one hundred and sixty-two days on meadows, for the oxen, was from 517.45 kilograms at the beginning to 731.45 at the end. The highest increase in weight was 303 kilograms, or 6 cwt.; the lowest amounted to 221 kilograms, or nearly to 4½ cwt. The average daily increase amounted to about 3 pounds. Another farmer in the Weser marshes last year fed eight oxen on his best pasture grounds. They had lost during the winter housing and bad feeding about 5 cwt.

When put on the pastures, on May 4, Nos. 1 to 4 weighed about 30 cwt. and Nos. 5 to 8 about 35 cwt. When sold, on November 3, Nos. 1 to 4 weighed about 56 cwt. and Nos. 5 to 8 about 51 cwt. Average augmentation of weight per head, about 4 cwt., or about 43.5 per cent., or per day per head about 2½ pounds. The result of this grazing shows the value of the grass in the marshes for fattening cattle.

In the marshes it is common with the farmers to keep a larger number of cattle than their stables can accommodate during the winter. The overplus, in most every instance consisting of young animals, are usually sent to farmers in the Geestlands, there to be fed. The price paid for such feeding varies from $7 to $9 per head. This low price of course does not allow a feeding with good, nourishing fodder, the ani-

mals mostly being fed on straw, so that in general these cattle return in a very lamentable state or condition when the grazing time commences. For some time several of the farmers in the Weser marshes, Jeverland, and East Friesland have desisted from this old plan and are finding for their cattle better and larger accommodations, and feed them during the winter with more nourishing fodder, consisting of beans, cracked grain, and the different sorts of oil-cakes and rice. The rough forage is used in its natural state uncut, while cabbages, turnips, &c., are cut.

The housing of the cattle during the winter corresponds with the method in Holland. The feeding cribs, contrary to the method in use in the south of Germany, are situated a little lower than the floor in which the cattle stand, so as to give them more ease when rising. The whole arrangement in the stable enables the farmer to keep the cattle cleaner and clean them easier than otherwise would be the case. There is, also, a considerable saving of space and litter. In the marshes the calving of the cows in general takes place in the months from November to February, as this period is considered by all interested the most favorable, as it enables the breeders to bring the young calves to the grazing grounds early in spring. If brought there when younger the animals would hardly be able to withstand the inclemency of the weather. The new-born calves are not allowed to suck at the cows. The milk taken from the cows during the first three weeks only is given to them. After this time they are fed on buttermilk, bread soup, to accustom them gradually to a more consistent food. Cow and bull calves are fed just the same. To many of our farmers in the United States, this feeding may appear irrational, but experience shows that calves fed in this manner progress far more favorably than those fed for a longer period on milk, as these come into the pasture grounds with a tender stomach and with a luxuriant layer of flesh on their carcasses, which is not desired.

The young heifers, after the completion of their second year, are led to the bull. By this time these young animals have reached the development particular to the cattle bred in the marshes, so that they are able to support the embryo and to calve without injury to themselves.

Bulls when thirteen to fourteen months old cover cows. It is much to be regretted that for some time the breeders of these valuable animals when they are at their best development, sell the bulls to foreign breeders without any consideration as to the want at home. The Government and the unions of the herd-book try to put a stop to this injurious disposition, but without any avail. The prices paid by foreign breeders being so high as to enable the proprietors of such bulls to return the premium they received on the condition that the animal had to remain at least one year in the district for which the premium was granted.

Another factor in the breeding of the cattle in the marshes is the climate, which, to those not born and bred there, appears less than agreeable. The average fall of rain amounts to about 707 millimeters annually. In consequence of this climate, of which the middle temperature in summer seldom raises over 8° Reaumur, together with the more or less hardy rearing which the cattle in the marshes must endure, the latter may be classed as thoroughly sound and healthy. In no part of the northerly marshes do less diseases among cattle appear than here; contagious diseases, if any prevail, are brought here, and are sooner extirpated than in any other district. The broad chest of these cattle and their sound lungs prevent any pulmonary diseases. For a series of

years no contagious diseases have been observed in this district; if brought in from Holland and other adjacent countries they always were localized and arrested in the places infected, wherefore I can only repeat my former assertion that the cattle in the marshes are the most hardy and healthy race of North Germany and Holland.

Having already reported in the foregoing on the disposition made of the overproduce of these cattle by the breeders, I only need refer to the annexed tables, in which further particulars are to be found.

AMERICAN CATTLE AND HOGS IN OLDENBURG.

Concerning the importation of live cattle from the United States to this district, I have to state that so far I find it to be confined to a few head. These did not come up to the expectations, showing too much of the Shorthorn blood, thereby taking a long time to fatten; so that this importation ceased after the first trial. Lately, however, live pigs of the Poland-China race have been imported from the United States with some success. These importations would no doubt have been more numerous if a reliable connection with breeders in the United States was easier to obtain. As it is, the commission, shipping, and expenses charged greatly enhance the prices. A respectable commission appointed here for sale or exchange of cattle for breeding or grazing purposes would, no doubt, greatly assist in the transaction of the cattle business, and certainly in a short time would render a good account.

IMPORTS OF MEATS AND DAIRY PRODUCTS.

Of other cattle produce imported here by way of Bremen and Hamburg, I have to mention besides canned meats, salt beef in barrels, salt pork in barrels, butter, and cheese. The salt beef, not only used for ships' provisions but also for inland consumption, is of some moment, whilst the importations of salt pork in barrels, by reason of the prohibitive import laws of Germany, consist only of those qualities used for ships' provisions—salt bacon, as well as refined lard, for inland consumption being strictly prohibited, the import thereof has entirely ceased. In official quarters in Berlin it would appear that the seafaring people of Germany are not considered subject to trichynosis, otherwise the exemption as above stated would not have been allowed.

The importation of butter or margarine is limited, as butter is overproduced here, and commands in the Bremen and Hamburg markets prices nearly 10 to 25 per cent. higher than other butter. The consumption of American butter and margarine is more or less confined to the more saving class of the population, whilst the poorer classes eat none at all, in lieu thereof eating raw smoked bacon.

PERCENTAGES OF THE DIFFERENT BREEDS OF CATTLE IN THE DISTRICT.

The percentage of the pure bred Oldenburg, Jeverland, and East Frisian cattle is about 65 to 75 per cent. in either province, whilst the Shorthorn cattle, bred only in the Weser marshes by one or two breeders, amount to about 10 per cent. The remainder is of a mixed breeds, not necessary to enumerate. For dairy purposes nearly 25 per cent. are bred, the remainder for breeding, slaughtering, or exportation.

BEST CATTLE FOR EXPORT TO THE UNITED STATES.

I am of the opinion that the best cattle to be imported into the United States from Germany, to improve the breed there, without any doubt

are the Oldenburg or Budjadinger race. Exact prices are not obtainable, as they vary from $100 to $200, according to age, quality, &c.

SPECIAL STATISTICS OF THE MARSH CATTLE.

In conclusion I submit answers to the questions transmitted with circular, giving names of breeds, country, size of cattle at maturity, milking qualities, origin of breed, topography of country, substratum, &c.

Name of breed.	Annual average yield of milk.	Milk to pounds of butter.	Milk to pound of cheese.	Size at maturity, measured on the fore parts (in meters).			Live weight.					
				Cow.	Bull.	Ox.	Cow.		Bull.		Ox.	
	Cwt.						*Cwt.*		*Cwt.*		*Cwt.*	
Oldenburg, bred in the Weser marshes.	61	25	Not made.	1.49	1.51	1.57	14	to 15	16	to 18	17	to 20
Jeverland race	68	38 to 39	16	1.39	1.42	1.48	12	13	14	15	15	17
Geestland races	50	38	Not made.	1.34	1.36	1.29		9		11		12
Ost Frisian race	64 to 84	35 38	16	1.32	1.47	1.61	12	14	16	17	18	20
Shorthorn race	50 60	33	Not made.	1.50	1.52	1.60	14	16	20	22	20	22

Breed.	Age at maturity.	Weight of meat at maturity of ox.*	Color.	Description.	How long bred pure.
	Years.	*Cwt.*			
Wesermash	3½ to 4	8 to 9	Black and white with white star on forehead.	Head shorter, as with the Holland race; short legs; structure perfect.	A long time, except now and then crossed with Shorthorns.
Jeverland	4 5	8 9	White and black and four white feet.	Head longer; legs finer and longer; very good milkers.	A long time.
Geestland	3 4	6 6.72	White and black	do	Do.
Ost Friesland	4	9 11	Black and white; white legs; star on forehead and black saddle on back; about 20 per cent. red.	do	Said to be of the Anglia race; breed a long time.
Shorthorn	4 5	10 12	White and red; some blue-black or mouse-colored.	Fine looking animals but rather too fat for inland consumption; require at least one year more grazing than the other races.	Twelve to fifteen years.

Breed.	Origin of breed.	Product.					
		Labor.	Meat.		Milk.		Cheese.
Wesermarsh	Pure Oldenburg breed with few exceptions.	(*)	$90 to $135		$70 to $80		(†)
Jeverland	Original breed	(*)	100	125	70	80	$25
Geestland	Diverse breed	$50 to $80	75	90		60	(‡)
Ost Friesland	Now said to be original; now and then crossed with Holland breed.	(‡)	85	90	70	80	25
Shorthorn	England	(*)	100	125	60	70	(†)

* None required. † None produced. ‡ Not used for labor.

Topography.

District.	Altitude above high-water mark.	Mean temperature.	Summer.	Winter.
	Feet.	°*R.*	°*R.*	°*R.*
Wesermarsh	2 to 15	5 to 6	7 to 8	1½ to 2½
Jeverland	8 10	5 7	8 9	1½ 2½
Geestland	15 40	7 8	7 8	1 2
Ost Friesland	2 2½	5 6	7 8	1½ 2½

Soil.

District.	Alluvial.	Loam.	Clay.	Sandy, &c.
Wesermarsh	Entirely.	.....	All	None.
Jeverland	½	½	.....	.....
Geestland	None.	⅛	None.	⅛
Ost Friesland	½	½	½	None.

Substratum.

District.	Limestone.	Sandstone.	Granite.	Clay.	Gravel, &c.
Wesermarsh	None.	None.	None.	All.	None.
Jeverland	None.	None.	None.	All	None.
Geestland	None.	None.	None.	None.	½
Ost Friesland	None.	None.	None.	½	None.

Cultivated grasses.

District.	Timothy.	Clover.	Rye grass, &c.
Wesermarsh	(*)	(*)	(*)
Jeverland	.....	.....	.....
Geestland	⅛	½	None.
Ost Friesland	½	⅛	None.

* Natural grasses.

Method of housing.—In stables built of bricks and thatched with reed, very healthy and warm in the winter. In summer, from April 30 to November 1, animals are feeding on the meadows.

Feeding.—Grass in summer. Hay, grain, beans bruised, oil-cakes, and different sorts of turnips in winter.

Breeding.—The bulls used for public use are selected by a commission. The herd-book is open for registry.

Handling products.—The live cattle are either sold at public sales or by private contract, or are sent into the interior by private commissioners. Butter and cheese are disposed of at Bremen or Hamburg.

JOHN M. WILSON,
Consul.

CATTLE IN SAXONY.

REPORT BY CONSUL MASON, OF DRESDEN.

I have the honor to reply to circular issued from the Department of State July 18, 1883.

The importance of the subject I immediately comprehended, and set to work to furnish all the information I could obtain, and hence the apparent delay in responding.

I found the greatest difficulty in procuring the desired information, especially that which would enable me to complete the tables or blanks furnished by the Department. At last I applied to the statistical bureau of Saxony for what information they could furnish me, to report to the Department of State. They replied in the following communication:

[Translation.]

The respectfully undersigned board of managers deeply regret being unable fully to answer the questions contained in the circular issued by the Department of State, Washington, on the 18th of July last, as inquiries relative to the diffusion of the various breeds of cattle and the fecundity of the offspring to be met with throughout the country have, up to this time, not been instituted. By means of the researches made in the year 1880 concerning the amount of bulls kept throughout the country, some valuable information has, however, been gained with regard to the breeds of bulls used for breeding purposes. As one is, at any rate, able to draw conclusions, from the bulls in existence, to the cut or tendency of the breeding, the undersigned board of managers have the honor of submitting to the consulate the results of the investigation under consideration in one of the supplements; in addition to which we beg to subjoin to the circular, which we do hereby return, a variety of jottings appertaining to the areas used for farming purposes, the live weight, and the selling value of the beasts, together with the results of the latest census of animals.

The Kingdom of Saxony does not only import vast quantities of cattle to be butchered for the market, but also introduces numbers of Oldenburg and Dutch cows, giving fresh milk, or great with young, which, subsequently to being milked until they cease to yield any more, are slaughtered, or, like imported heifers, used for breeding purposes. Only Voigtland draft oxen and fattened ones, or such as are undergoing a course of feeding, are exported in rather large quantities. The Voigtland cattle, which formerly were in very brisk demand, not only on account of the uncommon richness of their milk, but also by reason of their being strikingly adapted to be stall-fed, and, in particular, owing to their serviceableness as beasts of draft, are less frequently used for breeding purposes than they formerly were. The extension of this breed, which is the only one indigenous to this country, is but very trifling, since it is not to be met with anywhere except in the vicinity of Plauen, Oelsnitz, and Auerbach, consequently, in an area of 142,627 hectares. The stock of pure Voigtland beasts had formerly been diminished by exportation, which was carried to immoderate lengths. The efforts made by husbandmen and farmers of late to supply the markets with as much milk as possible has more and more dislodged or supplanted Voigtland cows. The Voigtland cattle, a reddish brown or bay-colored breed, of small build or stature, have white horns with black tips, and tails with white ends or points.

Accompanying the above communication were a set of tables embodying all the information obtainable from their cattle census of 1883.

While they do not conform strictly to the requirements of the blank tables furnished by the Department, I have thought it advisable and best to copy and transmit them in the form received from the statistical bureau. The labor was great, and the courtesy corresponding, by the statistical bureau, which I duly acknowledged in appropriate terms, and promised reciprocal courtesies at any time by this consulate, or any Department of the Government of the United States, when desired.

The courtesy, not only in this instance, but at all times, and by all departments of the Saxon Government, has always been complete and satisfactory, and it gives me great pleasure to assure the Department of it.

JOS. T. MASON,
Consul.

UNITED STATES CONSULATE,
Dresden, November 26, 1885.

SAXON AGRICULTURAL AND CATTLE STATISTICS.

Areas that have proved productive, in an agricultural point of view, together with the areas appropriated to herbage for fodder, in the Kingdom of Saxony.

[Prepared at the royal Saxon statistical office, and translated and transmitted by Consul Mason, of Dresden.]

Departments of administration.	Mean altitude (elevation above the Baltic).	Population in the year 1880.	Total area.	Area that proved productive in an agricultural point of view in 1878.				
				Arable land and land cultivated as gardens.	Meadow ground.	Pasturage.	Vineyards.	Sum total.
Shrievalties:	*Meters.*		*Hect.*	*Hect.*	*Hect.*	*Hect.*	*Hect.*	*Hect.*
Bautzen	285.2	351,326	246,973.23	124,138.04	34,538.27	4,220.93	0.46	162,937.70
Dresden	299.4	808,512	433,685.73	240,584.91	49,057.12	3,829.31	1,263.04	294,734.28
Leipsic	179.3	707,826	356,735.44	244,270.98	35,286.42	2,826.07	19.33	282,403.70
Zwickau	468.3	1,105,141	461,809.91	203,274.31	67,255.57	4,592.46	0.12	275,122.26
Kingdom	308.1	2,972,805	1,499,294.31	872,268.24	186,137.18	15,529.67	1,282.95	1,015,218.04

Departments of administration.	The following herbages for fodder and grasses were cultivated as main crops or produce in the year 1878.								In addition to which spurry, &c., was cultivated as an after or a later crop.
	Clover.	Esparcet, book's head, and serradella.	Spurry.	Timothy grass, meadow cat's-tail grass.	Rye-grass.	Lucern.	Various kinds of other grasses.	Sum total.	
Shrievalties:	*Hect.*	*Hect.*	*Hect.*	*Hect.*	*Hect.*	*Hect.*	*Hect.*	*Hect.*	*Hect.*
Bautzen	15,560.62	39.85	204.61	0.88	26.04	18.91	228.21	16,079.12	2,166.33
Dresden	28,809.20	36.32	17.06	3,195.66	150.50	221.16	4,340.04	34,769.94	811.80
Leipsic	24,727.13	5.61	9.06	55.16	317.63	214.15	1,794.96	27,123.70	191.06
Zwickau	23,237.60	.....	0.34	3,944.85	81.97	66.00	6,196.70	33,527.46	308.92
Kingdom	90,384.55	81.78	231.07	7,196.55	576.14	520.22	12,559.91	111,500.22	3,478.13

Breeds and number of bulls used for breeding purposes in Saxony in 1880.

Departments of administration.	Low country breeds.							English breeds.	Spotted mountain breeds.		
	Dutch.	Oldenburg.	Dessau.	Old Margravlates.	Anglers.	Wilstermarsh.	Breitenburg.		Simmo Valley.	Borne.	Pinzgau.
Shrievalties:											
Bautzen	232	266	1	.....	.....	.....	.....	34	1	.....	.....
Dresden	139	1,003	10	10	3	1	16	21	5	3	11
Leipsic	261	520	8	1	.....	4	1	34	8	9	3
Zwickau	181	373	3	.....	.....	.....	.....	6	49	46	.....
Kingdom	813	2,162	22	11	3	5	17	95	63	58	14

Breeds and number of bulls used for breeding purposes in Saxony, in 1880—Continued.

Departments of administration.	Gray mountain breeds.			Glan Valley.	Voigtland.	Crossing of native cattle with the preceding breeds.	Dublons breeds.	Bulls without any dedicate cut or tendency of breed.	Sum total.
	Allgau.	Swiss.	Wals Valley.						
Shrievalties:									
Bautzen	51	5	....	....	....	490	26	820	1,325
Dresden	138	3	....	....	....	651	148	1,019	3,181
Leipsic	388	17	4	....	6	672	48	628	2,612
Zwickau	303	9	1	9	130	426	59	805	2,460
Kingdom	880	34	5	9	136	2,248	281	3,272	10,128

Diffusion or extension of the various kinds of molds or vegetable earths in Saxony.

	Hectares.	Per cent.
Collective area belonging to—		
Diluvium	348,048	23.21
Granite and syenite	231,275	15.42
Gneiss	206,871	13.76
Clay-slate	161,376	10.76
Glimmer-slate (Glimmerschiefer)	96,509	6.57
The formation of peat (brown coal)	85,393	5.69
Porphyr and melaphyr	78,309	5.22
The lower new red sandstone (new red conglomerate)	74,767	5.00
The formation of graywacke	52,243	3.48
Whitestone	46,597	3.11
Square stone (broad stone)	44,651	2.98
Diabase (primitive rock)	31,711	2.11
Ten other molds	40,508	2.69
Total	1,499,767	100.00

STOCK OF CATTLE IN THE KINGDOM OF SAXONY.

[Statement prepared at the royal Saxon office of statistics, and translated and transmitted by Consul Mason.]

On the 10th of January last a general census of cattle, or brute poll, was taken throughout the German realm, and almost at the very same time investigations were made relative to the selling price and the live weight of the beasts. The results of both the official enumerations in question, as far as the Kingdom of Saxony is concerned, have been prepared and duly submitted to us. It consequently is in our power to compute or estimate the aggregate value and the collective weight of the cattle kept in the country. In Saxony both the average selling value and the average live-weight of an animal of middling quality have been ascertained by the instrumentality of the agricultural district associations. According to the middling selling value of the various animals with regard to the prefectships, the total stock of cattle throughout the country is valued at 238,761,268 marks.

The same is composed as follows, viz:

Number of live animals.

Description.	Number.	Estimated total value.	Value per head.
Horses.		*Marks.*	*Marks.*
Foals less than one year old	1,850	331,705	179.3
Foals from one to two years old	3,061	1,106,013	361.3
Foals from two to three years old	4,024	2,121,369	527.1
Stallions three years old, and exceeding that age	156	167,685	1,074.9
Others three years old, and exceeding that age	117,795	79,939,354	678.6
Horses	126,886	83,666,216	.....
Mules and hinnies	18	3,930	218.3
Asses (donkeys)	26	2,084	78.3
Neat or horned cattle.			
Calves less than six weeks old	15,606	457,164	29.3
Calves from six weeks to six months old	40,382	2,483,504	60.3
Fawns, or young animals from one-half year to two years old	118,703	14,720,064	124.0
Bulls two years old, and exceeding that age	4,903	1,249,530	254.8
Other oxen or bulls two years, and exceeding that age	29,685	7,730,681	260.4
Cows two years old, and exceeding that age	442,050	106,427,655	240.7
Horned cattle in general	651,329	133,018,688	.....
Sheep.			
Fine wooled sheep kept for shearing purposes, less than one year old.	9,848	161,363	16.4
Fine wooled sheep kept for shearing purposes, one year old and older.	31,267	787,338	25.2
Improved sheep bred for butcher, less than one year old	15,412	306,816	19.9
Improved sheep bred for butcher, one year old and older	42,473	1,238,619	29.2
Other sheep less than one year old	10,782	140,207	13.0
Other sheep one year old, and exceeding that age	39,235	793,905	20.2
Sheep in general	149,037	3,434,528	.....
Swine.			
Sucking pigs and porkers less than one year old	282,568	8,654,644	30.6
Breeding sows (farrows) upwards of one year old	28,287	2,806,914	99.2
Other swine one year old, and exceeding that age	44,695	5,303,489	118.6
Swine in general	355,550	16,765,047	.....
Goats.			
Kids less than one year old	21,466	233,065	10.8
Goats one year old, and exceeding that age	95,081	1,637,760	17.2
Goats in general	116,547	1,870,825	

The live weight has only been ascertained with regard to horned animals and swine.

Description.	Number.	Total weight.	Average weight.
Horned cattle.		*Pounds.*	*Pounds.*
Calves less than six weeks old	15,606	1,512,175	96.9
Calves from six weeks to six months old	40,382	7,580,129	187.7
Fawns or young animals from a half year to two years old	118,703	47,488,723	400.1
Bulls two years old, and exceeding that age	4,903	4,647,113	947.8
Other oxen and bulls two years old, and exceeding that age	29,685	26,358,360	887.9
Cows two years old, and exceeding that age	442,050	351,131,055	794.3
Horned cattle in general	651,329	438,717,555	.....
Swine.			
Sucking pigs and porkers less than one year old	282,568	16,259,158	57.5
Breeding sows (farrows) one year old and older	28,287	6,227,497	220.2
Other swine one year old and older	44,695	11,821,841	264.5
Swine in general	355,550	34,308,496	

CATTLE CENSUS, OR BRUTE POLL, OF THE KINGDOM OF SAXONY.

[Taken January 10, 1883.]

Cattle belonging to households (farms) including such beasts as are temporarily absent.

Description.	Shrievalty of—				Total in 1883.	In 1873.
	Bautzen.	Dresden.	Leipsic.	Zwickau.		
Number of owners of cattle:*						
(1) Settled	32, 890	43, 462	36, 773	50, 352	163, 477	156, 836
(2) Unsettled	1, 247	4, 166	5, 224	2, 606	13, 243	12, 506
Calves up to 6 months old:						
(3) Up to 6 weeks	2, 533	4, 440	4, 270	4, 363	15, 606	
(4) From 6 weeks to 6 months (males)	1, 411	2, 443	1, 504	3, 569	8, 954	56, 633
(5) From 6 weeks to 6 months (females)	5, 465	9, 530	7, 429	9, 004	31. 428	
Fawns, or young animals from one-half year to 2 years old:						
(6) Bullocks (cattle for breeding)	2, 508	3, 765	4, 455	2, 857	13, 585	6, 885
(7) Gelded oxen	1, 136	3, 119	686	7, 588	12, 529	113, 317
(8) Female fawns	14, 424	26, 940	25, 482	25, 743	92, 589	
(9) Bullocks actually used for breeding purposes (in 6)	1, 105	1, 874	1, 794	1, 277	6, 050	6, 885
Horned cattle 2 years old and over:						
(10) Bulls (cattle for breeding) at least 2 years old	969	1, 511	1, 119	1, 284	4, 903	5, 909
(11) Any other bulls or oxen	3, 236	6, 456	2, 694	17, 299	29, 685	40, 443
(12) Cows	71, 128	133, 540	115, 873	121, 509	442, 050	424, 785
Total number (3 to 8 and 10 to 12)	102, 830	191, 744	163, 512	198, 243	651, 329	647, 972

*The number of owners apply to all live stock, cattle, horses, mules, asses, sheep, goats, and swine.

Horses, mules, and asses in Saxony.

Description.	Shrievalty.				Total in 1883.	Total in 1873.
	Bautzen.	Dresden.	Leipsic.	Zwickau.		
Foals:						
Less than one year	232	549	613	437	1, 850	1, 538
From one to two years	425	705	1, 113	818	3, 061	2, 214
From two to three years	461	836	1, 611	1, 116	4, 024	2, 153
Horses three years old and over:						
Stallions for breeding purposes	3	103	39	11	156	136
Used for agricultural labor	10, 562	26, 179	28, 521	17, 001	82, 263	76, 475
For military purposes	62	3, 114	2, 801	67	6, 044	5, 765
All other	2, 957	9, 444	8, 895	8, 192	29, 488	27, 511
Total	14, 721	40, 930	43, 593	27, 642	126, 886	115, 792
Foals born in the year 1882	174	294	422	274	1, 164	.....
Mules and hinnies	2	6	7	3	18	26
Asses	4	7	12	3	26	86

Sheep in Saxony.

Description.	Shrievalty.				Total in 1883.	Total in 1873.
	Bautzen.	Dresden.	Leipsic.	Zwickau.		
Fine-wooled sheep for shearing purposes, merinoes:						
Less than one year old	1, 032	2, 597	5, 259	960	9, 848	108, 465
One year old and over	2, 608	8, 743	17, 278	2, 638	31, 267	
Improved sheep bred for the butcher:						
Less than one year old	2, 689	3, 864	7, 178	1, 681	15, 412	50, 238
One year and over	6, 691	12, 398	18, 233	5, 211	42, 473	
All other sheep:						
Less than one year old	876	2, 206	5, 411	2, 289	10, 782	46, 130
One year old and over	2, 441	8, 433	20, 815	7, 566	39, 255	
Total	16, 337	38, 181	74, 174	20, 345	149, 037	204, 833

Swine and goats in Saxony.

Description.	Shrievalty.				Total in 1883.	Total in 1873.
	Bautzen.	Dresden.	Leipsic.	Zwickau.		
Swine:						
Less than one year old, including sucking pigs	80,182	86,216	114,772	51,398	282,568	.....
One year old and over:						
Breeding sows (farrows)	2,265	11,569	11,754	2,699	28,287	.....
Other swine at least one year old	4,678	12,427	15,782	11,608	44,495	.....
Total	87,825	110,212	142,308	65,705	355,550	301,369
Goats:						
Less than one year old and kids	6,545	6,287	4,025	4,609	21,466	.....
One year old and over:						
She goats	30,759	24,640	12,267	19,777	87,443	
Any other, at least one year old	1,416	2,641	1,403	2,178	7,638	.....
Total	38,720	33,568	17,695	26,564	116,547	105,487

Bees in Saxony.

Shrievalty.	Total number of bee-hives.	Hives with movable honey-combs among this total.
Bautzen	11,344	5,275
Dresden	15,657	4,300
Leipsic	14,783	6,304
Zwickau	11,972	5,891
Total in 1883	53,756	21,670
Total in 1873	64,367	18,579

SILESIAN CATTLE.

REPORT BY CONSUL DITHMAR, OF BRESLAU.

INTRODUCTORY AND EXPLANATORY.

In accordance with instructions contained in the circular of July 18, I inclose herewith the result of investigations regarding the altitudes, climate, soil, and cattle food-products of Silesia and its native and other breeds of cattle, with such information as was obtainable regarding the best breeds for the dairy, for work and for slaughter, the percentage of the various breeds kept in the province, and the amount and mode of export hence. In the absence of any printed statistics on these subjects, and of any work describing the native cattle of Silesia and the foreign breeds and crosses considered most desirable, I have been obliged to depend upon personal inquiry, verbal and in writing, and on the assistance of several gentlemen who were in position to obtain the most trustworthy information on the subject of the inquiries; notably Mr. A. Körte, author of a standard work on "The wool sheep," whose business in the last six weeks obliged him to traverse the province nearly from end to end; Professor Galle, dean of the philosophical faculty of the Breslau University, who furnished the altitudes and mean temperature of the country; Dr. Neefe, director of the Breslau statistical bureau, and Messrs Leo Sachs and Paul Puschmann.

SILESIA—AREA, CLIMATE, SOIL, TOPOGRAPHY, ETC.

Silesia, the southeastern province of the Kingdom of Prussia, has an area of 15,550 square miles, extending from north latitude 49.49 to 52.04, and from east longitude 31.21 to 36.56. It is divided into three administrative districts, Upper, Lower, and Middle Silesia, officially known by the names of their capitals, Oppeln, Liegnitz, and Breslau. The county of Glatz, still known by its old designation, belongs to Middle Silesia. The southern parts of Middle and Lower Silesia are mountainous; the rest of the province is flat, with the exception of some spurs of the Giant Mountains, which rise abruptly from the lowlands, the Trebnitz Hills, and the hilly portions of Upper Silesia. About 54 per cent. of the area is hilled land and gardens, 9.07 meadow land, 1.09 pasture land, and 29.07 woodland.

The temperature, both summer and winter, is uniform throughout the province, the winter mean being −1.4 to −2.4 C., the summer +17.3 to +18.3 C., and the annual mean +7−8 C. In the highlands of the Sudetics and in Upper Silesia, at an elevation of 650 to 1,300 feet, the mean winter temperature is −1.7 to −3.7 C., and that of summer +15 to +17.2 C. On the highest peak of the mountains, the Schneekoppe, 5,292 feet above the sea, the mean summer temperature is +8 C.; winter observations have only recently been made, and the mean has not yet been fixed. Breslau, situated nearly in the center of the province, at an altitude of nearly 400 feet, has a winter mean of −1.9 C. and a summer mean of +17.3 C.

The greater part of the province is drained by the Oder River, a small portion in the southeast by the Vistula, the wedge-shaped western extremity and the mountain district near the source of the Elbe (Silesian side of the Giant Mountains) by the latter river. As the country through which the Oder flows is for the most part but little higher than the surface of the river at ordinary high water, the stream has had to be diked nearly its entire length, the dikes at some places being within a few yards of the river bed, at others nearly half a mile distant. Once or twice in each year all the land within the dikes is inundated, and not infrequently the water overflows the banks. Within the banks the soil may be termed alluvial; not much effort is made to cultivate it, but it is good meadow land and yields fine crops of hay.

The highlands of the Sudetic range, with their valleys, possess a fruitful loamy soil of no great depth, being underlaid by granite, green sandstone, slate, basalt, and old limestone.

The soil on the left bank of the Oder is mostly clayey, with a considerable admixture of sand, but is esteemed for all agricultural purposes superior to that on the right bank, which is mainly sand and sandy loam, resting principally on recent limestone and red sandstone (coal formation). The altitude ranges from about 328 feet at the point where the Oder leaves the province to about 2,139 feet, the highest cultivated point in the Giant Mountains, and 4,200 feet, the highest point of summer pasturing. The two highest peaks are the Schneekoppe, in the Giant Mountains, over 5,000 feet, and the Schneeberg, in the Glatz Mountains, over 4,500 feet. (These names are applied to certain sections of the mountains; the entire range is known as the Sudetics.)

CATTLE FEEDING IN SILESIA.

Grasses.—The grasses cultivated are red clover, white clover, timothy, rye grass, esparsette (on limestone soil), lucerne, and serradella. In addition to these grasses, Indian corn, sown in drills, is cut green for

fodder (the grain does not ripen), and lupines, vetches, and fodder beans are also largely planted.

In my annual report for 1879 the number of hectares sown in grasses and other fodder plants was given, and as the proportion does not probably vary materially from year to year, except that a larger amount of Indian corn stalks is now produced—the figures are here reproduced.

Articles.	Hectares.	Articles.	Hectares.
Lupines	25,265	Serradella	2,250
Vetches	21,256	Esrrarsette	1,279
Fodder beans	1,877	Rye grass	1,009
Maize	8,975	Timothy	479
Clover	208,187	Other grasses	989
Lucerne	5,041	Other fodder plants	16,703

Root-feed.—Prominent among the articles of food, alike for dairy and for meat cattle, are the potato-mash "swill" produced by the 1,083 distilleries within the province, the "grains" from its 965 breweries, the best residuum or pulp from its 50 sugar factories, and the offal of its numerous potato-starch factories. I have before me a statement showing the amount of arable land, of wood and meadow land, water, &c., of an estate of 617 hectares in Lower Silesia, wherein, in the column devoted to live stock, occurs the following: "Cattle fattening—food procured from sugar factory and distillery." The exceptions to this method of feeding are the cattle farms and stables in whose immediate neighborhood the factory offal is not to be obtained. In such places potatoes, beets, and turnips form a part of the winter food.

HOUSING.

As a general rule cattle are confined in stables the year round, the land being considered too valuable for grazing, except for a few weeks in the late summer and autumn, before the stubble is plowed under. The stables are mostly warm and dry, and surrounded by the farmyard, into which the cattle are sometimes turned for a few hours' airing. Exceptions to the rule of dry and warm stables are, however, not wanting. In the mountain districts alone the cattle are pastured throughout the summer, and stable-feeding is practiced only in winter. The small farms in the lowlands, and such farm laborers and mechanics as are able to keep a cow, let their cattle graze along the waysides and ditches, feeding in the stables only night and morning.

CATTLE-BREEDING IN SILESIA.

As regards cattle breeding, this is systematically neglected by the small farmer, while many owners of large estates view the matter solely with an eye to present profit, without regard to the permanent improvement of their stock. They pay little attention to blood or pedigree, contenting themselves with the purchase of a few fine bulls selected from some stock of good repute, either at home or abroad.

DAIRY FARMING IN SILESIA.

Milk.—More care has been bestowed upon the treatment of dairy products in recent years than formerly, resulting partly from the establishment of a Government dairy school in Upper Silesia. Dairy associations, disposing of 8,000 to 20,000 liters of milk each per day, are of recent origin, but are already numerous. Dairy farms within easy dis-

IMPORTED BREEDS IN SILESIA.

On many of the larger estates and dairy farms none but imported breeds are kept, chiefly those from Holland, Frisia, Oldenburg, Schleswig-Holstein, and England. The Dutch cattle are the most numerous, but deteriorate here, owing either to the climate or to the difference in the food, or perhaps to both causes. Fresh stock is imported every few years by some farmers, others import only fresh bulls, while still others cross with other breeds, such as the Silesian, the Wilstermarsh, and the Oldenburg. The Dutch cattle, with the exception of the large Amsterdam breed, are black, and black and white; the latter are mainly dun-colored. The Dutch cows and their crosses give a large quantity of milk, less rich than that of the Silesians, The average yield is from 6,000 to 7,000 pounds per annum. Their live weight is 1,300 to 1,400 pounds.

THE FAVORITE BREEDS IN SILESIA.

Taking at random 400 of the larger estates in various parts of the province in order to ascertain which is the most favorite breed, I find that on these estates the following cattle are kept:

Breeds of cattle.	Estates.
Dutch cattle of more or less pure blood	141
Dutch and Silesian cross	35
Dutch and Oldenburg cross	20
Dutch and Swiss cross	10
Dutch and Shorthorn cross	9
Dutch, English, and Shorthorn cross	6
Dutch and Zillerthal cross	1
Dutch and Wilstermarsh cross	12
Dutch and English cross	1
Dutch and German cross	7
Dutch, Oldenburg, and Swiss cross	2
Dutch and Mürzthal (Styrian) cross	1
Dutch and East Frisian cross	1
Dutch, Swiss, and Wilstermarsh cross	1
Dutch and Algau (Bavarian) cross	3
Dutch and Dantzig cross	4
Dutch and Tondern (Holstein) cross	1
Dutch, Silesian, and Wilstermarsh cross	1
Dutch, Oldenburg and Wilstermarsh cross	1
Dutch and Ayrshire cross	1
Mixed Dutch and other races	14
Silesian Lowland	27
Silesian Highland	1
Silesian and Oldenburg cross	12
Silesian and Swiss cross	1
Silesian and Schleswig cross	1
Silesian and Shorthorn cross	3
Silesian Highland and Swiss cross	2
Silesian and Frisian cross	1
Oldenburg	15
Oldenburg and Shorthorn cross	3
Oldenburg and Wilstermarsh cross	3
Oldenburg and Swiss cross	1
East Frisian	9
East Frisian and Wilstermarsh cross	2
Wilstermarsh	7
Wilstermarsh, Montafun, and Swiss cross	1
Wilstermarsh and other Holsteins	2
Wilstermarsh and mixed breeds	2
Cows of various breeds and Wilstermarsh bulls	1
Shorthorns	4
Shorthorns and Ayrshires	1
Shorthorns and mixed breeds	2

Breeds of cattle.	Estates.
Ayrshires	3
Swiss	5
Swiss with various crosses	3
Dantzig	1
Murzthal	1
Algau	3
Old German	1
Tondern	1
Mixed breeds of various races	9

PRODUCTS FROM DUTCH COWS IN SILESIA.

The following answers were received to inquiries addressed to two large estates keeping Dutch cows:

From the vicinity of Strehlen, midway between Breslau and the mountains.

Breed: Dutch, of pure blood.
Annual average quantity of milk: 2,800 liters.
Quantity of milk to pound of butter: 100 liters to 7 pounds.
Country of origin: Holland.
Size at maturity: 140 to 150 centimeters high.
Live weight: 1,000 to 1,200 pounds.
Age at maturity: Four years.
Weight at maturity: 550 to 650 pounds.
Color: Black and white.
Description: Broad chest, broad haunches, small neck and tail, horns curved forward.
Bred pure since 1872. We import 20 head of young cattle from Holland every three to three and a half years.
Labor: Valued at 48 cents per day.
Meat: Worth $7.85½ to $8.57 per cwt., live weight.
Milk: We get 2½ cents per liter from cheese factory.
Cheese: Worth at factory $5.71 to $5.95 per cwt.
Method of housing: In plastered stables.
Feeding: Nine months dry; three months green fodder.
Breeding: For dairy and fattening purposes.

From Masselwitz, on the Oder, a few miles above Breslau.

We keep an average of 60 cows, 2 bulls, 24 working oxen, and 15 to 30 slaughter oxen.
The cows are mostly Hollanders, with a few Silesians. They yield an average of 8 to 9 liters of milk daily. Fifteen liters of milk required for 1 pound of butter; 7 liters for 1 pound of cheese.
Cows at maturity are 140 to 150 centimeters high; weigh 900 to 1,000 pounds; are 50 to 60 centimeters across hips, and 40 centimeters across back. Fattened weight, 1,100 to 1,400 pounds. The color of Dutch cattle is usually black and white, but a few are also dun and white; head and tail small, horns curved inward.
The Hollanders were kept pure-blooded for ten years. Last year began crossing with Simmenthal bulls.
The milk is sold to city dairies for 2½ cents per liter.
The working oxen are of the Bavarian breed; red, large horns; quick gait; yoke on head.
Soil is partly loam, partly sand.

CENSUS AND DISTRIBUTION OF CATTLE IN SILESIA.

As already stated, the number of cattle in the province on the 10th of February last was 1,394,145. Of these there were in Upper Silesia 461,223, in Lower Silesia 412,653, and in Middle Silesia 520,269. In 1873, the number of cattle in the entire province was 1,351,431, consisting of 810,695 cows over two years old, 202,355 of these being used as working cattle in the fields; 139,042 calves under six months old; 296,714 young cattle from six months to two years old, including 11,208

bulls reared for breeding purposes; 13,809 bulls (breeding animals) over two years old, and 91,171 oxen over two years old. In 1861 the entire number of cattle was 1,060,501, including 684,842 cows over two years old. In 1840 there were 847,200 head of cattle, 510,475 being cows upward of two years old; and in 1816 the figures were 681,201 entire number, and 398,106 cows over two years. The proportion of cows to the entire number in 1883 I was unable to obtain.

HENRY DITHMAR,
Consul.

UNITED STATES CONSULATE,
Breslau, November 16, 1884.

CATTLE IN THURINGIA.

REPORT BY CONSUL MOSHER, OF SONNEBERG.

DESCRIPTION OF THURINGIA.

Thuringia is a mountainous district in Central Germany, lying in about 28° to 30° longitude, and about 50° to 51° 45′ latitude. Its mean elevation is about 1,350 feet, and its mean annual temperature is about 6.5° Réaumur. The official record for Coburg (altitude, 902 feet) is as follows: December to February, —0.73°; March to May, 6.3°; June to August, 13.73°; September to November, 6.62° (Réaumur).

Quite one-half of this territory is covered with forests of spruce and fir, with occasional fine groves of beech, oak, and maple. The soil is sandy, with a substratum of clay-slate in the southeastern half and of porphyry in the northwestern. Fertile meadows and pleasant valleys abound throughout the district, which yield a good quantity of fine, sweet grass. The cultivated grasses are red clover and lucerne.

The inhabitants are classed as an agricultural people, but it is a noteworthy fact that nearly all the manual labor of the farm, the plowing, the sowing, the planting, the haying, the harvesting, and the shoveling, is done by the women, while the men are either in the army or are engaged in the manufactories for dolls, toys, slates, porcelain, and glassware, which abound in this region.

DESCRIPTION OF THE CATTLE OF THURINGIA.

Breeds.—The cattle in Thuringia embrace a variety of breeds, such as the Allgauer, the Heilbronner, the Frankish, and the Glan, all of which have sprung from the Bavarian race, which is itself an offspring of the Swiss-brown and the Fararlberger breeds. For the purposes of this report it will be sufficient to confine attention to the Allgauer cattle, which are bred in Southern Thuringia towards the Bavarian frontier; to the Heilbronner breed, which is a cross of the red Simmenthaler (Swiss) and the Frankish cattle, being found most plentifully in the Dukedom of Meiningen; and to the Glan race, which is the prevailing stock in the more mountainous regions.

The Allgauer breed.—It is the concurrent testimony of all dairymen that no pure stock can be satisfactorily bred in Thuringia. The nearest approach to it is in the southern portion of the district, in the valley of the Itz, where the Allgauer cattle are found in the best condition. But even here there is a noticeable modification of the finer character-

istics of the breed, as it is found in Frankish Bavaria. The head is borne less proudly, the eyes are less bright, and the horns are less symmetrical. The neck is short and stout, the back strong and rather long, the chest and rump broad, the body deep, the ribs barrel-shaped, the bag nearer square than round, the teats long and with a tendency to flatness, and the color varying from a dark brown to a whitish yellow. They are not dainty in respect to food, and easily adapt themselves to changes of location and diet. The cows of this breed reach a living weight of from 900 to 1,200 pounds. They average about 2,500 quarts (5,000 pounds) of milk per year, the milk being rich, and the quantity continuing without much variation until the animals are from twelve to sixteen years. While at pasture it is reckoned that about 10 or 11 quarts of their milk produce about 1 pound of butter, while in winter from 12 to 15 quarts are necessary. It is also estimated that with these cows 100 pounds of hay produce 25 quarts of milk and 2½ pounds of butter.

The Heilbronner breed.—The Heilbronner cattle, which appear in Meiningen, are excellent milk-givers, some of them producing as many as 16 quarts daily, but the average is about 10 quarts. The milk is rich, and they can usually be milked until about four weeks before the time of calving. On an average about 10 quarts of their milk is required for 1 pound of butter or for 5 pounds of cheese. They are more compact than the cattle of the Allgauer breed. Their color is not uniform, but varies from a dark red to a yellowish hue. They have a well-shaped body, a deep and broad chest, a heavy rump, a smallish head, bright eyes, short, smooth, whitish horns, fine hair, symmetrical legs, and a brisk motion. They weigh from 750 to 1,000 pounds, the ox being about 300 pounds, and the bull 500 pounds heavier than the cow.

The Glan breed.—The Glan cattle, which are really the cattle of the country, are somewhat rougher-looking animals than either of the breeds already mentioned, and this is doubtless owing, in part, to the less favorable circumstances in which they live. Their origin is respectable, since they came from pairing the red Swiss with the old and now extinct native Thuringian cattle, but hard usage and a somewhat rigorous *régime* have eliminated many of the finer qualities of their ancestors. They are stout, rough-haired, dirty-hued, unintelligent-looking animals, varying in size from that of the compact Jersey to the average American ox. The weight of the cow is from 700 to 1,000 pounds, the ox 1,100 pounds, and the bull 1,400 pounds. They are supposed to attain their maturity at the age of five years, but they show no failure of strength and productiveness until they are from eleven to fifteen years old. They average about 9 quarts of milk and one-half pound of butter per day.

SIZING CATTLE IN THURINGIA.

Cattle are sized in this country by taking their height from the ground to the top of the fore shoulder, as horses are sized in most countries. The girth is never taken into account. The Allgauer and Heilbronner cow stands about 140 centimeters (4 feet 2 inches), and the bull and the ox about 150 centimeters (4 feet 6 inches). The Glan cow stands about 145 centimeters, and the ox and bull about 155 centimeters.

COWS AS DRAFT-CATTLE.

A noticeable feature of industrial life in this region is the almost universal use of the cow as a draft-animal. In the labor of the farm

women take the place of men and cows the place of oxen. Comparatively few horses and oxen are seen, but nearly every family, especially in the country and small villages, owns at least one cow, and they use them, either singly or in pairs, for all kinds of draft-work. Instead of a yoke, a narrow piece of wood passes across the forehead, just beneath the horns, to each end of which a chain or leather trace is attached, passing thence through lug-holes in a surcingle around the waist to whipple-trees that are fastened to the load. Thus the strain comes upon the forehead and neck. The cows wear iron shoes like oxen. They are worked the year around, their owners claiming that it makes but little difference in either the quantity or quality of their milk. All grades of cattle are used in this way, even the dainty Allgauer being sought by many farmers primarily on account of their powers as draft-animals. Such usage through many generations has, I think, produced a kind of masculine grossness and stoutness in the cows which is not noticeable in their native homes and normal condition.

HOUSING CATTLE IN THURINGIA.

The ordinary cattle-barn is a long, low, stone building, with a stone floor, a 6 to 8 foot post, a vaulted ceiling, and space in the roof for storing fodder. But it is a very common thing to find only one building on the farm, the family occupying one end of the basement and the cattle the other, with the fodder in the loft. Or the whole basement may be given to the cattle, the family and the fodder sharing the second floor between them; or else the family takes the whole of the second story and sends the fodder into the attic. There is a movement against this practice, especially in the larger towns and among the insurance companies, because it is believed to be responsible for very many fires. The bedding most in use is, in the few large cities, straw; but in the country and most of the towns and villages it is the newly-grown part of the spruce and the fir, chopped fine, the coarser part of the branches being retained for fire-wood. It is claimed that this kind of bedding is subsequently valuable as a dressing for the land.

CATTLE-FEEDING IN THURINGIA.

The methods of feeding are quite similar in all parts of the district. The cattle are usually fed three times a day, and the bill of fare embraces hay, straw, "scalded food," and occasionally turnips. The allowance for each cow is an equivalent of 25 pounds of hay daily. The hay embraces red clover, lucern, and the native grass of the country, which is of a fine, nutritious quality, and is usually cut two and three times between June and October. The straw (oat, rye, and barley) is generally chopped, and about two-thirds more in weight is allowed than of hay. The "scalded food," which is used much in dairies and in cold weather, consists usually of rye-bran broth or of a thin mixture of oatmeal and water, which is supposed to stimulate the milk-producing powers. Owing to the use of the cows as draft-animals, pasturage, as it is practiced in most countries, is almost unknown here.

BREEDING CATTLE AND HANDLING THEIR PRODUCTS.

There is no "gentle breeding" of stock in this region. No calf is "born to the purple," unless it may sometimes happen to be the offspring of a favorite animal on some one of the two or three "model farms" which are under ducal patronage and direction; but each one, if he

escapes the butcher's knife while he is of tender age, must, as a rule, serve an ignominious apprenticeship in the traces, preparatory to being hitched to the plow or to some other wearisome load. There is rarely ever a warm place prepared for the cow at the interesting periods of her life, and the calf, dropped upon a cold stone floor or upon a bed of needle-like spruce tips, may consider itself fortunate if it is allowed to feed in the natural way the first fortnight of its existence, before being brought to the skimmed-milk trough or to the sour-milk bucket.

But I should say that there are several "model farms" in the district, where the best Swiss stock is kept and where the housing and care are more comfortable. Even here the verdict is that the best-blooded stock will not breed pure, and that the cross between the Frankish and Simmenthaler cattle gives the best results.

The treatment of the calf is about as follows: Sweet milk until the eighth or ninth week, in daily quantities of about one-fifth the weight of the calf, with one-half pound of coarse oat-meal and 1 pound of hay in the ninth week; in the tenth and eleventh weeks, about 14 quarts of milk, 2 pounds of coarse oat-meal, and 5 pounds of hay daily; in the twelfth week eight quarts of milk, 4 pounds of oat-meal, and 10 pounds of hay daily; in the thirteenth week, 4 quarts of milk, 3 pounds of oat-meal, and 10 pounds of hay daily, by which time the calf is supposed to be able to gradually abstain from all liquid food and to confine itself to grass and hay.

THURINGIAN BUTTER AND CHEESE.

Very little cheese is made in Thuringia, the reason being that it is considered more economical to sell or consume butter and milk, which are eaten very freely, and buy cheese from Holland and Switzerland. Cheese-making was tried a few years ago at the Rosenau farm, in Southern Thuringia, but it was soon given up for lack of satisfactory results. The ordinary Swiss cheese retails here at 30 cents a pound. Milk retails at about 4 cents a quart and butter at 30 cents a pound. Taking all cattle together, the average yield of milk is about 2,400 quarts yearly for eleven years. This would represent a money value of about $1,056. Ten quarts of milk are supposed to yield 1 pound of butter, which would represent a money value of $792.

RESULTS OF BREEDING IMPORTED STOCK.

It is generally held that imported breeds, such as Holsteins, Shorthorns, and Jerseys are superior in the United States to what they are in their native homes. Such a result is not obtained in this country, but I am convinced that this is owing quite as much to lack of proper location and treatment as to any other cause. Such stock is almost never "trained for condition" here, and the indifferent treatment which it receives, and the hard work to which all grades of cattle are put, do not furnish suitable data for judging what any breed is capable of becoming. The most that I feel warranted in saying is, that there is no breed here whose present condition, whatever may have been its antecedents, would warrant the experiment of importing them into the United States.

DISTRIBUTIVE STATISTICS.

The population of the district under consideration is about 1,800,000, and the number of cattle is estimated at 475,000, of which 10½ per cent. are of the Allgauer breed, 10½ per cent. of the Heilbronner breed, 31½

per cent. of the Frankish breed, and 47½ per cent. of the Glan breed. It is difficult to say what percentage is bred for the dairy, because the stocks have for a long time been selected with quite as much reference to their powers as draft-animals as to their dairy qualities. All through the rural districts the cow *must* be a good draft-animal, and then the more milk she gives the better. It cannot be said that positively bad results have attended this method of selecting cattle, for, while the cows quite generally supersede oxen and horses in farm-work and in miscellaneous drawing, they yield a good average quantity of rather rich milk. The stock of cattle is just about equal to the home demand for food, but that is because the people are large bread-eaters rather than great meat-eaters. The most of the meat is eaten in the villages and large towns. The flesh is fairly good, but it is not remarkable either for its sweetness or its juiciness. The demand for beef is lessened by the amount of sausage and other swine-flesh that is consumed.

The accompanying table presents the main facts of this report in a more compact form.

GEORGE F. MOSHER,
Consul.

UNITED STATES CONSULATE,
Sonneberg, November 10, 1883.

SPECIAL STATISTICS CONCERNING THURINGIAN CATTLE.

Allgauer, Heilbronner, Frankish, and Glan, all going under collective name of Frankish cattle. The annual average production of milk is 4,600 pounds; 10 to 12 quarts make 1 pound butter, and 10 to 12 quarts make 5 pounds cheese. The size at maturity is: Cow, 142 centimeters; bull, 149 centimeters; ox, 152* centimeters. Live weight is: Cow, 750; bull, 1,250; ox, 1,300. Age at maturity, 5 years. Weight of meat at maturity: Cow, 450; ox, 1,000; bull, 950. Color, dark brown to yellowish. Description: Head short and wide; eyes bright; horns short, smooth, whitish, with black points; neck short and stout; back strong, long, and level; ribs barrel-shaped; body deep; rump heavy; tail slender; bag long, squarish, and clean; teats long and flattish. Pure breeding not successful and hardly exists. Cross between Simmenthaler and Frankish probably one hundred and fifty years. Origin of breed is Swiss through Frankish or Bavarian channel. Product: Labor, $500 to $2,500; meat, $75; milk, $1,056; butter, $792.

Topography: Altitude, 1,350 feet; mean temperature, 6.5° Réaumur; summer, June to August 13.72° R.; winter, December to February, —0.73° R.

Substratum: Porphyry and clay, slate, gravel, &c.

Cultivated grasses: Timothy, red clover, and lucern.

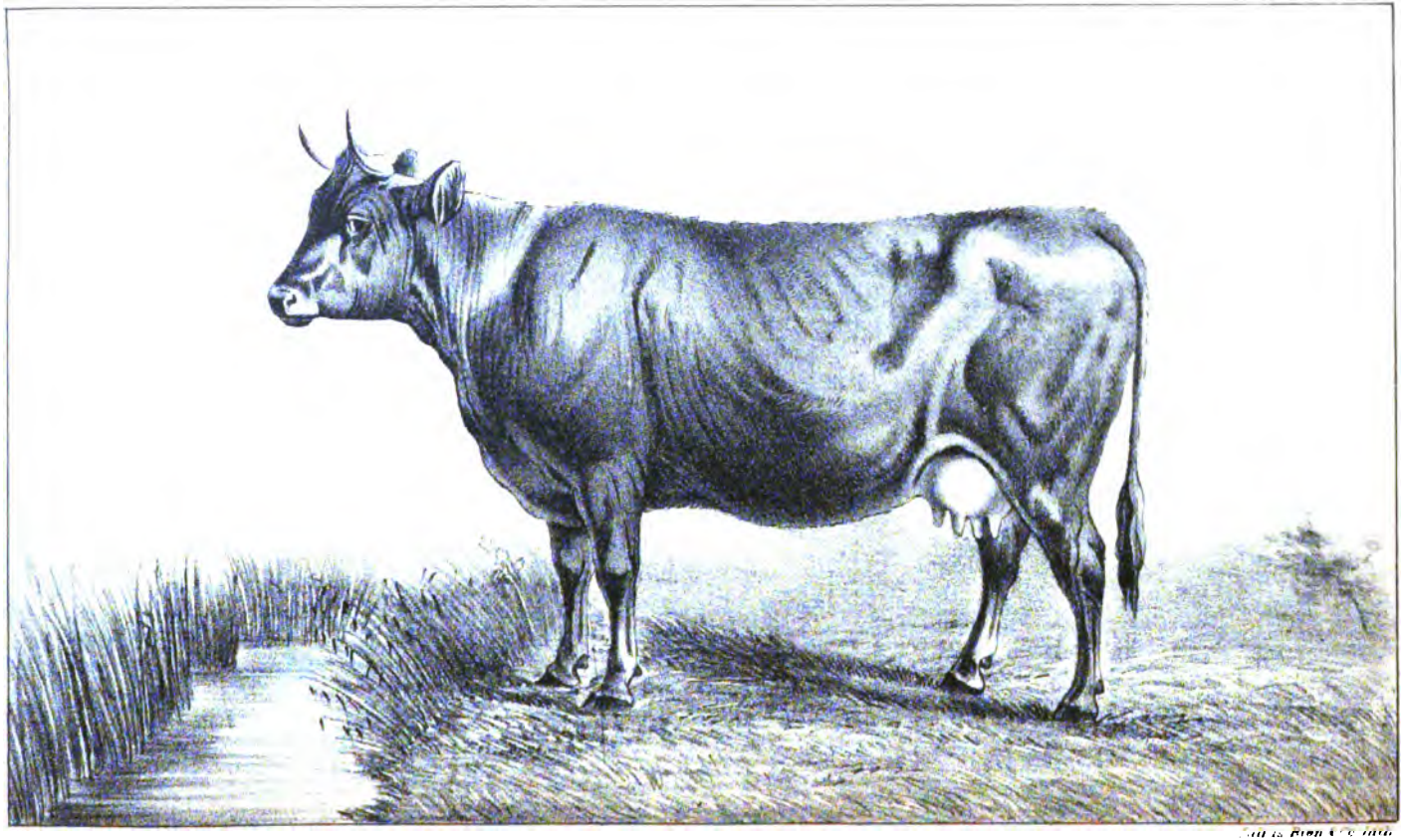
The cattle are housed in stone barn, stone floor. The equivalent of 25 pounds of hay, daily (hay, chopped straw, scalded food), is the food. Breeding not carefully attended to. Stock is handled rudely and not with care to best results. Flesh consumed in district. Milk and butter sold at market or consumed at home.

VOIGTLAND CATTLE.

REPORT BY CONSUL BULLOCK, OF ANNABERG.

In Saxon-Voigtland, in the consular district of Annaberg, cattle-raisers give much attention to the Voigtland race of cattle, which long experience has proven to be well suited to the climatic conditions prevailing here. This breed of cattle has its home in Saxon and Bavarian-Voigtland, that is, in Southwest Saxony and the Bavarian Ober-

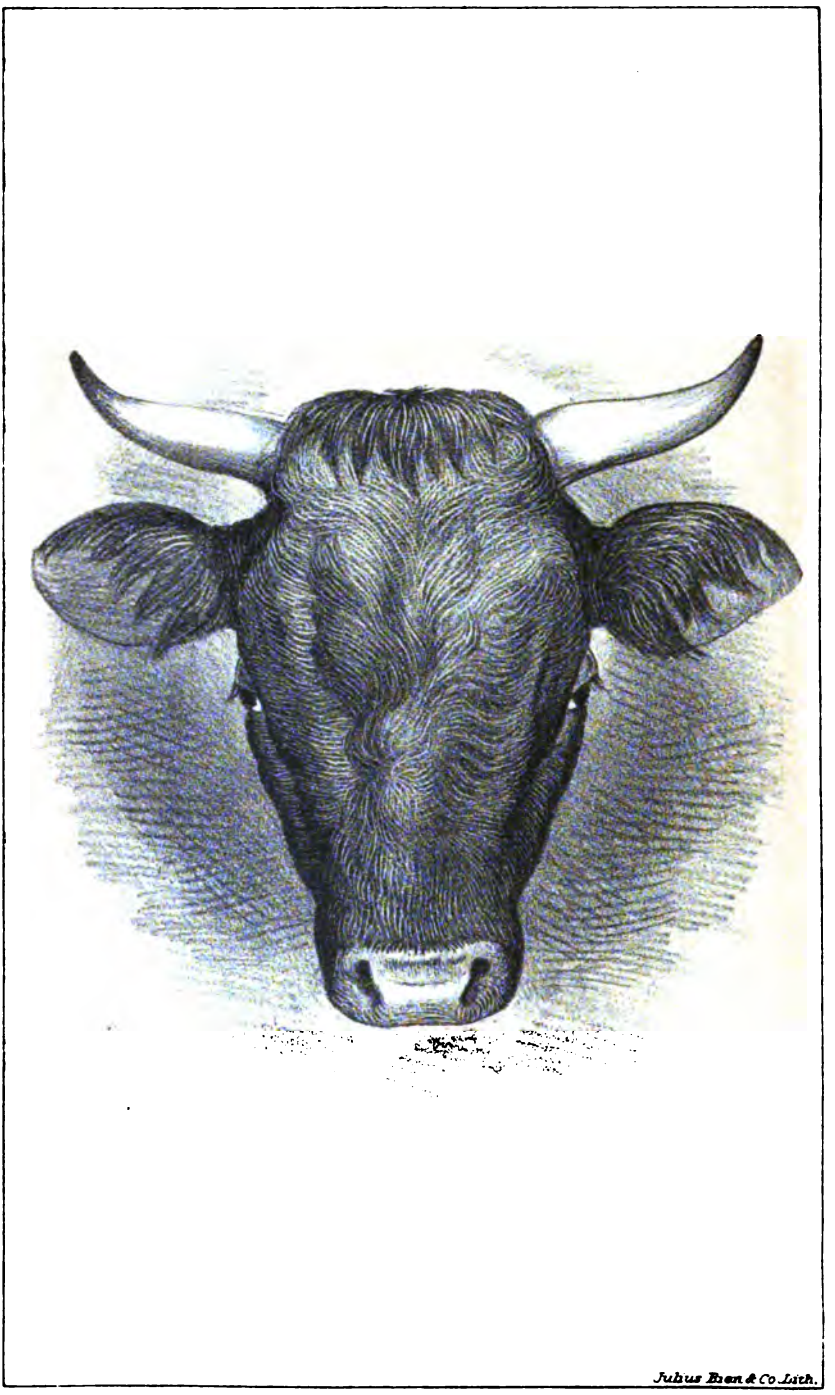
* From ground to top of fore shoulder.



VOIGTLAND COW

Julius Bien & Co. Lith.

VOIGHTLAND COW.



VOIGHTLAND BULL.

Pfalz. Voigtland is a well cultivated highland, with an average elevation of 1,300 feet, and an annual mean temperature of 48° Fahrenheit. The annual rainfall is 29 inches, and the time between the first and last snowfall of the year is about one hundred and fifty days.

ORIGIN OF THE BREED.

In the early part of the present century Zillerthal (Tyrol) cattle were brought into Voigtland, and the origin of the present breed of Voigtland cattle dates from the time of this cross.

CHARACTERISTICS.

The following are the distinguishing features of this race of cattle: The body color is chestnut-brown, without marks; the tuft of the tail yellow, and udder bright red. Bright red is also the color of the membrane of the eyelids, of the tongue, and of the mouth. The body is long and well arched, the back broad, with full thighs, and the hide is thick and soft. Average live weight, 750 to 850 pounds. Yearly milk production, 375 to 400 gallons. The cattle of this race are very hardy and are easily fattened, and are much sought after for beef. They are, however, not of rapid growth.

The measurements of a bull and seven cows of the Voigtland race gave the following results:

Lines of measurement.	Bull.	Cows.
	Inches.	*Inches.*
Line between horns	6½	6
Narrow part of forehead	7½	6½
Broad part of forehead	7½	9
Cheek	6½	6½
Length of head	17	17

Plate 1 shows the head of a three-and-a-half-year-old bull; Plate 2 the head of a four-year-old cow, with the following measurements:

Lines of measurement.	Bull.	Cow.
	Inches.	*Inches.*
Line between horns	5	4½
Narrow part of forehead	7½	6½
Broad part of forehead	9½	8½
Length of head	17½	17½
Height of back	48	47½
Height of rump	49½	49½
Length of trunk	48½	47½

Plate 3 shows a Voigtland cow exhibited at the Bremen cattle-show of 1882.

GEO. E. BULLOCK,
United States Consul.

ANNABERG, *April* 30, 1884.

CATTLE-BREEDING IN WURTEMBERG.

REPORT BY CONSUL CATLIN, OF STUTTGART.

CATTLE CENSUS OF WURTEMBERG.

A cattle census made throughout the Kingdom of Wurtemberg, on the 10th day of January last, showed that there were in the Kingdom on that day 904,139 head of cattle, valued at 169,425,318 marks (about $40,000,000), and weighing in the aggregate 534,212,296 pounds. They were subdivided in age and sex as follows:

Description.	Number.	Weight.	Value.
		Kilos.	*Marks.*
Calves under 6 weeks	34,185	1,580,505	1,949,069
Calves 6 weeks to 6 months	98,200	8,213,422	6,040,615
From 6 months to 2 years	211,262	42,412,011	27,399,161
Bulls and oxen, 2 years and over	*100,755	47,584,915	29,532,763
Cows	450,737	167,315,293	105,403,690
Total	904,139	267,106,148	169,425,318

* Including 7,524 breeding bulls.

The population of the Kingdom (see census of 1880) was 1,971,118; its area is 7,675 square miles. There is, therefore, one head of cattle to every 2.18 of population, and 117.8 head of cattle to every square mile of area.

There are to be found in the Kingdom, in all, five principal breeds: the Simmenthaler, Montafoner, Allgauer, Limburger, and Neckarschlag; the two first of which are imported, the others native stock.

THE SIMMENTHALER BREED.

As early as the middle of the last century the importation of Simmenthaler cattle from Switzerland into Wurtemberg began, though at first in small numbers. This breed derives its name from the valley of the Simme, from which locality it seems originally to have sprung, though most of those at present purchased come from the Canton Glarus, and some from the vicinity of Berne. Dr. Von Rueff, director of the Royal Veterinary School in this city, in his work on "Die Racen des Rindes," thinks that many indications point to this breed as the future one for Germany, and this opinion gains all the more weight from the fact that the Simmenthaler race, better than any other, fulfills all three of the conditions (breeding, milk, and labor) requisite to good cattle. Many Wurtemberg agricultural associations, including those at Stuttgart, Ludwigsburg, Heilbronn, Urach, Münsingen, Kirchheim, Nurtingen, Rottweil, Balingen, Marbach, Warblingen, Varhingen, Rottenburg, and Tubingen, use the Simmenthaler breed for the improvement of their stock.

Weight and food.—According to a statement made by Professor Rau, of Hohenheim, and covering the period from 1838 to 1856, the Simmenthaler cattle at that place had an average weight (on the hoof) of 1,306 pounds, and an average yearly yield of 2,570 kilos of milk to a daily average consumption equivalent to 37 pounds of hay. According to a previous reckoning made at the same place the average weight of the

cows was 1,300 to 1,350 pounds, and of bulls, 2,200 to 2,300 pounds on the hoof. The ten-months cattle of this breed are found to consume an average of 19.15 pounds of hay, and gained during six months' daily observation 1.135 pounds in weight per day. Of summer fodder, *i. e.*, red clover, lucern, and bran, the one-and-a-half-year-olds consumed 26.73 pounds (estimating 4½ pounds of grass, clover, &c., to 1 of hay), and gained daily 1.98 pounds in weight. The older cattle consumed exactly 3 pounds of stall-fodder to every 100 pounds of their own weight. To keep the fully grown stock in good condition, however, only the equivalent of 1½ pounds of hay for every 100 pounds of their own weight should be fed them.

Animals from three months to one year old are fed daily 19 pounds to an average weight of 475 pounds, *i. e.*, about 4 pounds for every 100 pounds of weight.

Cattle in their second year are fed daily 22 pounds to an average weight of 700 pounds, *i. e.*, about 3 pounds for every 100 pounds of weight.

Cows while with calf, and in their third year, are fed 28 pounds to an average weight of 1,000 pounds, *i. e.*, 2⅟₇ pounds for every 100 pounds of weight.

There is reckoned to every 100 pounds of fodder an average increase in weight as follows: Cattle of both sexes, 3 months to 1 year, 7.94 pounds; cows, 1 year to 2 years, 6.12 pounds; cows (in calf) in their third year, 3.82 pounds.

As the result of observations conducted for one year, it has been found that the Simmenthaler cows average 7,294 pounds of milk and one calf, averaging 96 pounds weight, per annum. In a year, subdivided into 174 days of winter fodder, 134 days of summer fodder, and 57 days of autumn fodder (365 days in all), they average 17,193 pounds of fodder, or 47⅓ pounds daily; or, on an average weight of 1,500 pounds to the animal, 3.14 pounds of fodder to every 100 pounds of weight.

On a basis of 100 pounds of fodder to every 6 pounds of calf produced, there may be reckoned also 45⅓ pounds of milk for every 100 pounds of fodder. The Simmenthaler milk produced at Hohenheim yields 12 to 15 per cent. of cream, and contains, according to chemical analysis, 11 to 13 per cent. of solid substance.

Characteristics of Simmenthaler cattle.—The distinguishing characteristics of the Simmenthaler cattle are as follows: Small, light head, with gentle, lively expression, and fine horns pointed well forward and upward, and in most cases rather flat at the roots, more oval than round in form, and in the bulls often somewhat rough, and pointing backward and downward. Neck fine, rather short, with a strong dew-lap; body well rounded at the ribs and locked at the loins. The hind quarters are broad and long and frequently with prominent caudal bone. The latter characteristic, though a natural one in the races of mountain cattle, is much condemned by many in Germany, though it involves no real ground for prejudice to the animal. The fundament is very low and remarkably regular, the upper parts are strongly provided with muscles, the parts under the knees are fine, and the hoofs well made and hard. The udders are well formed, though not giving the same flow of milk found in the German cows. The hide is in some cases very fine and tender, but in many others very coarse, with rough hair and with a somewhat bullish look. In this respect a marked difference declares itself between the Simmenthaler breed and the Frutiger breed, and its explanation is found in the varied conditions of pasturage and

climate. The disposition of the animals of this breed is remarkably good-natured, almost playful. Their gait is very broad and sure, one might almost say graceful. The weight on the hoof averages, in the pure Simmenthalers, about 1,400 pounds, and in the stocks bred from them 1,000 to 1,200 pounds.

THE MONTAFONER BREED.

This, the second-mentioned imported stock in Wurtemberg, is one developed from the Schwytzer stock by breeding, and further by change in climate, pasture, and conditions of soil. The Montafoner cattle are lighter than the Schwytzers and heavier than the Allgauers, the cows averaging about 1,000 to 1,200 pounds. Their color is black or dark brown, with the same characteristics as the Schwytzer breed, namely, the mouth shaped like a deer, light-shaded stripes over the back and light tufts of hair in the ears; the head is short, with wide forehead, and the horns white only at the base, the remainder being black; the neck is short and compact, with thick folds; the shoulders are broad and the back has a tendency to curve downwards. The haunches are also broad; the caudal bone often too high; the limbs compact, stout, and the udders large. In good cows the annual yield of milk is as high as 1,900 liters, and of a quality giving 9¼ pounds of butter and 16½ pounds of cheese to every 100 liters. The oxen are tough, good for hauling, and are quite easily fattened, but give a coarse-fibered meat. The original home of this breed is in the Montafoner Valley, which opens into the valley of the Upper Rhine, a few hours distant from the Lake of Constance. Inasmuch as the Montafoner cows are not so fastidious as many others in regard to fodder, they are much used in Wurtemberg for crossing in localities where sour grasses abound, as, for instance, at Waldsee, Ehingen, Tettnang, and Saulgau. In general the Montafoner breed may be said to be easy of acclimation.

THE ALLGAUER BREED.

This breed is to be classified among the dark-brown mountain cattle, and is the smallest and most varied in shade of them all. It is principally found in or near the Swabian Alps, but owing to its usefulness has spread over the lowlands as well, is found in considerable numbers in the neighborhood of Wangen and Isny, in this Kingdom, and is imported in large numbers for breeding purposes to Saxony, Baden, Prussia, Bohemia, Poland, and Hungary.

The cows average 800 to 900 pounds in weight, and vary greatly in color. The head is small and handsomely formed; the mouth black and broad; the horns white at the base and black at the point; the neck short, with good and well-defined folds; back and haunches broad and compact; caudal bone generally high, but not so frequently rising above the level of the back as in the case of the Simmenthaler and Montafoner breeds; the chest, as is generally the case with good milch cows, is not very wide or deep, for which reason many Allgauer cattle are complained of as being hollow shouldered; the ribs of the belly are, however, wide; the belly itself is broad and deep, and the whole frame muscular and compact. The oxen are strikingly large in comparison with the cows and bulls, and the calves when born are also disproportionately large. Cows weighing 700 to 800 pounds, and consuming a daily average equivalent to 25 pounds of hay, yield 1,900 liters of milk per annum.

It takes 10 liters of their milk to make 1 pound of butter. According to a comparative trial made in Saxony the Allgauer cows produced 29.38 liters, the Holland cows 25.26 liters, and the Saxon cows only 23.16 liters of milk to every 100 pounds of hay, or its equivalent, consumed. The meat of the Allgauer breed, on the other hand, is less valuable than that of the other breeds mentioned, its fiber being coarse, dry, quite red, and very tough.

THE LIMBURGER BREED.

Under this title two breeds exist, one originating in the province of Limburg, in Belgium, the other, and the one which this report more properly concerns, in the neighborhood of Schwäbisch Hall, in Wurtemberg. This latter breed is found most in use in the vicinity of Gaildorf, Aalen, Gmund, and on the estates of Count von Rechberg and Baron von Wollwarth. Their color is tawny-yellow, pea-yellow, and silver-yellow (*silberfalb*), mostly without any marks; the skin is fine, so that it not only falls in graceful folds upon the neck, but also frequently in transverse folds. As distinguishing marks of the race may be mentioned yellow horns and hoofs; as well as flesh-colored and almost hairless skin around the eyes. The head is long, narrow, light, and in many cases with curved profile; the horns fine, round, and in most cases projecting upwards and forwards. The chest is but little developed; the shanks generally flat, with but few muscles, and ungainly in shape. It is a light country breed, giving a good yield of milk, and, moreover, noticeable on account of the fine fiber of its beef. The cows are very small in comparison with the oxen bred from them, weighing only 600 to 700 pounds, while the oxen weigh as high as 1,500 to 1,600 pounds on the hoof. The cows give about 1,800 liters of milk per annum, 10 pounds of the milk giving about 1½ pounds of butter.

THE NECKAR BREED.

This is a race special to Wurtemberg, having its origin in the neighborhood of Heilbronn on the Neckar, whither, as long ago as the end of the last century, bulls were imported from Bern for crossing with the native stock, but later this crossing was carried on in such a manner that an especial value came to be attached to the thoroughly red cattle, resulting in the development of an intermediate breed, rarely parti-colored, which now widely exists in the counties of Heilbronn, Neckarsulm, and Leonberg. It was formerly much easier to obtain cattle of the single color from the Simmenthal region, inasmuch as here, as everywhere, the effect of prevailing fashion in cattle-breeding made itself felt, though, of course, limited somewhat with reference to the animal's usefulness. Thus, for instance, Rychner relates that formerly in the Canton Bern only red cattle were in demand, while later, a demand suddenly sprung up for parti-colored ones, even though the latter were prejudicial to trade. Formerly only delicately made cattle were sought for; afterwards they could not be found coarse enough. For years past the Neckar breed has maintained its pure red color, with a large and somewhat heavy body and low belly. Its form, as regards the head and horns, is lighter than is found in the breeds sired from Swiss bulls. The folds of the flesh are thick; the breast finely developed, and the haunches regular, with a much better caudal bone than is found in the Simmenthalers. The bones are short, the hind legs somewhat curved,

and the skin rather thick. A cow on the hoof averages 1,000 to 1,200 pounds weight. This breed gives a better quality of milk, and a tenderer beef than the Simmenthaler. The oxen are also much in demand as draft animals, and can be fattened to a weight of 1,800 pounds. Calves when born are generally large and heavy.

PRICES OF WURTEMBERG CATTLE.

The average price at which a bull or a cow of the five breeds above described can be purchased in the localities where they respectively originate is as follows:

Breed.	Bull.	Cow.
	*Marks.	Marks.
Simmenthaler	600	500
Allgauer	450	350
Montafuner	500	400
Limburger	500	400
Neckar	450	350

* The mark equals 23.8 cents.

WEIGHT OF WURTEMBERG CATTLE.

The average weight of a bull, ox, and cow of the five different breeds, when slaughtered, is as follows:

Breed.	Bull.	Ox.	Cow.
	Kilos.	Kilos.	Kilos.
Simmenthaler	600	500	450
Allgauer	400	350	300
Montafuner	500	400	350
Limburger	550	450	400
Neckar	400	350	300

CATTLE-BREEDING AT THE AGRICULTURAL SCHOOL AT HOHENHEIM.

In the preparation of this report I have made it my duty to visit the agricultural school at Hohenheim, about 5 miles to the eastward of this city, and long and widely known throughout all Europe as one of the foremost institutions of its kind on the continent. The school occupies a large collection of buildings, which were built as a residence for the Duke Karl, of Wurtemberg, about one hundred years ago, and is surrounded by spacious farm lands devoted to the practical exemplification of the instruction given in the various branches of agriculture. Prominent among the branches to which attention is given is cattle-breeding, which is here carried on systematically and on the latest scientific principles. I was much gratified by being enabled to make a personal inspection of the fine collection of Simmenthaler stock, some eighty or ninety in all, forming the finest collection in Wurtemberg and probably one of the finest in Germany. Through the kindness of Professor Dr. Vossler, a leading and efficient member of the faculty, I am so fortunate as to have been placed in possession of a great variety of interesting information on this and kindred subjects. I subjoin herewith Professor Vossler's answers to my various questions as follows, viz:

Question. How many breeds of cattle are to be found in Wurtemberg? Which are native and which imported?

Answer. The breeds of cattle in Wurtemberg may be classified as follows, viz:

NATIVE.

Yellow and red (of which but few exist).—(1) Alb; (2) Teck; (3) Schwabisch Hall; (4) Limburger; (5) breeds (principally the Neckar race) resulting from crossing of the foregoing breeds with others, chiefly with yellow, red, and parti-colored Simmenthalers.

Grayish brown.—(6) Allgauer; (7) breeds resulting from crossings of Allgauers with Schwitzers, Montafoners, and Simmenthalers.

IMPORTED.

Red and spotted.—(8) Simmenthaler.
Grayish-brown.—(9) Montafoner; (10) Schwitzer (Rigi).
Lowland breeds.—(11) Hollander (striped).

MISCELLANEOUS.

(12) Ansbacher (Triesdorfer); (13) Durham; (14) Gurtenvieh; (15) the White Rosenstein stock from the royal grounds at Rosenstein.

Question. Do the imported breeds, when suitably located and managed, produce in Wurtemberg offspring superior to that produced by the same breeds in their original homes; and, if so, is this superiority more marked in the succeeding generations than in the first?

Answer. The breeding capacity of the Simmenthaler and Montafoner races remains about the same, while in the case of the striped cattle the yield of milk often diminishes somewhat.

Question. Which would be the best method for exporting these breeds from Wurtemberg to the United States?

Answer. Young cattle from good stock might probably be exported, provided care were taken that young calves and cows in calf were not subjected to great suffering on the sea voyage, and that the costs of transportation were not too high.

Question. What is the average purchasing price paid for a bull and a cow in the original home?

Answer. For animals of the two races principally imported for renewing and improving the native Wurtemberg stock, the following prices are paid, viz:

Description.	Age.	Weight.	Prices.
	Years.	*Kilos.*	*Marks.*
Simmenthaler:			
Bull	1½	600	1,200
Cow	2	600	1,000 to 1,600
Montafoner:			
Bull	1½	550	600
Cow	2	450	400

Question. What is the estimated value in Wurtemberg of a good bull, ox, and cow of each breed?

Answer. Of the Simmenthaler breed, a bull, 300 to 1,000 marks; an ox, 400 to 600 marks; and a cow, 300 to 600 marks. Of the crossed breeds, a bull, 200 to 500 marks; an ox, 300 to 600 marks; and a cow, 200 to 400 marks.

Question. What is the estimated number and value of cattle in Wurtemberg per breed, according to the last census?

Answer. According to the enumeration made without regard to race, on the 10th of January, 1883, there were in Wurtemberg, of the cattle comprised in this enumeration, about two-thirds Simmenthalers and crossings of Simmenthalers with native stock, and the remainder of Allgauers and crossings with them.

Question. What percentage is bred for the dairy and the butcher?

Answer. There are no cattle exclusively raised as beef cattle in the Kingdom. Calves from eight days to four weeks old and unfit for breeding, old cows and bulls and oxen, which have been fattened after having served as draft animals for several years, are sent to the butcher

Question. Does the stock increase or decrease, and what is the cause?

Answer. The stock of cattle increases, but that of sheep decreases, as will be seen by the following statement:

Year.	Cattle.	Sheep.
1840	825,767	676,695
1883	904,189	550,104
Increase	78,422	.....
Decrease	.....	126,591

Question. Is the stock of the country sufficient for home demand, and if there is a surplus, what becomes of it?

Answer. In proportion to area and population, Wurtemberg is the largest cattle-growing section of Germany. The ratio for all Germany is 29.2 cattle to every square kilometer and 35 cattle to every 100 inhabitants, whereas in Wurtemberg it is 48.5 to every square kilometer and 47 to every 100 inhabitants. The surplus is exported principally to France (as beef), to Bavaria, and to North Germany (for breeding and draft purposes). The export from Upper Suabia and the Black Forest generally goes to Switzerland. Importations, and those only for breeding purposes, are made principally from Switzerland, and very few from Holland.

Question. Which section of Wurtemberg is most favorable for grazing and cattle-breeding?

Answer. Strictly speaking a regular system of pasturage is only found in the Allgau region (counties of Wangen and Leutkirch), but the conditions necessary to cattle-breeding are everywhere favorable. The places at which the breeding of Simmenthalers and breeds crossed from them is conducted most systematically and carefully are Rottweil, the Folders, Hohenheim, and in the vicinity of Heilbronn.

Question. What proportion of the population is engaged in cattle-raising and agricultural pursuits?

Answer. About 48.2 per cent. of the population are employed in such pursuits, including cattle-breeding and the dairy business.

STABLING, FEEDING, AND BREEDING.

Stabling.—The stables in use are generally strongly built ones, in which the cattle are tied to the fodder trough. Stalls in which the cattle can walk about are seldom used, and then only for younger animals. Dung is removed daily.

Feeding.—Calves up to twelve or fourteen weeks are fed on milk. But little prepared and much cut fodder is given. In summer in the stall green fodder is given. Pasturage is found only in the Allgau region.

Breeding.—In the main carefully conducted. Stock is renewed by the purchase of foreign bulls. Bulls are officially inspected. About 20 thoroughbred bulls are annually sold from Hohenheim.

BULL-KEEPING AT KIRCHHEIM UNDER TECK.

In the course of my inquiries on the subject, I have had occasion, upon the courteous invitation of Oberamtmann Loeflund, president of the Agricultural District Association at Kirchheim under Teck, to visit that town, the center of a fertile and prosperous grazing district, distant about two hours from Stuttgart, and to inspect the system of bull-keeping as conducted there for years past. The result may be summarized as follows:

Statement showing the annual and aggregate costs, expenses, and losses of purchasing and maintaining six breeding bulls at Kirchheim under Teck, in Wurtemberg, during a period of five years.

	1878–'79.	1879–'80.	1880–'81.	1881–'82.	1882–'83.	Total.	Yearly average.
EXPENDITURES.							
	Marks.	*Marks.*	*Marks.*	*Marks.*	*Marks.*	*Marks.*	*Marks.*
Purchase-money	1,299.60	678.75	1,040.25	1,423.20	887.00	5,328.80	1,065.76
Fodder	1,879.28	1,521.83	1,393.45	1,517.44	1,421.01	7,733.06	1,546.61
Straw	452.16	249.93	261.96	317.81	459.08	1,740.94	348.19
Treatment	30.70	12.00	14.16	17.60	5.23	79.69	15.94
Stable expenses	37.99	43.60	16.97	14.50	24.07	143.23	28.65
Salt	14.00	12.00	14.40	11.20	16.00	67.60	13.52
Costs of sale	10.64	6.70	7.60	13.96	6.76	45.66	9.13
Total	3,724.37	2,530.95	2,748.79	3,315.71	2,819.15	15,138.97	3,027.81
RECEIPTS.							
Service of bulls	1,564.00	718.00	790.00	1,714.00	913.00	5,699.00	1,139.80
Dung and gütte	640.20	517.10	678.40	523.80	839.60	2,799.10	559.82
Total	2,204.20	1,235.10	1,468.40	2,237.80	1,452.60	8,498.10	1,699.62
Excess of expenditures over receipts	1,520.17	1,295.85	1,280.39	1,077.91	1,366.55	6,640.87	*1,328.19

* To this should be added the amount paid the bull-keeper for services, 420 marks, making a total of 1,748.19 marks in all.

TOPOGRAPHY OF KIRCHHEIM UNDER TECK (WURTEMBERG).

Altitude: 310 meters (1,017 English feet) above the level of the sea. The highest point in the district is 810 meters above the level of the sea.

Mean temperature: (Yearly average): Celsius, 8.8°; Réaumur, 7°; Fahrenheit, 48°. Summer: (in August): Celsius, 17.6°; Réaumur, 14°; Fahrenheit, 64°. Winter (in January): Celsius, —1.5°; Réaumur, —1.2°; Fahrenheit, 29°.

Soil: Alluvial. The valley bottoms are partly filled with soil from the mountain slides. Loam everywhere predominates, and rarely mixed with sand. Clay is found everywhere. In the lower, brown jura sand is very plentiful, as the product of sandstone.

CATTLE-BREEDING AT ROTTWEIL.

Among the points in the Kingdom where cattle-breeding has been carried on scientifically, with more or less success, is the neighborhood of Rottweil, a flourishing town in the Black Forest section. With a view of obtaining such information as was practicable in that quarter on the subject embraced in this report I addressed a letter of inquiry to Oeconomierath Burkhardt, president of the Rottweil Agricultural Association, and received the following reply:

ROTTWEIL, *October* 21, 1883.

In reply to your favor of the 19th instant I have the honor to state as follows: The county (district of Rottweil) has for many years past ranked among the foremost in regard to cattle-breeding. Although the sale of animals for breeding purposes is always a very considerable one, and the extraordinarily high prices obtained for choice stock result in the sending elsewhere of the finest specimens, yet no reaction is noticeable. Bred since forty years in one direction (crossing with the Simmenthaler) a homogeneousness of race has been developed, so that experts at once recognize the animals, even when exported to long distances, as the "Rottweil" breed. A very efficient cause of the present condition of our cattle-breeding may be mentioned, the keeping of township bulls as practiced in the district for forty years past.

For the renewal of stock, which takes place every three or four years with original Simmenthaler bulls (no cows have been imported for twenty years past), only well-built and delicately-shaped specimens are selected, the thick-skinned, hollow-shouldered, heavy breed, that yields little milk, having for a long time been abandoned.

In consequence of the system of cattle-shows with premiums, introduced by the centralstelle for agriculture, a considerable progress in cattle-breeding has been noted in Wurtemberg. As at present in the district of Rottweil the hoof disease—showing,

however, no malignant symptoms—prevails quite generally, the present moment would be unfavorable for an inspection.

I have had the honor to state herewith that which is in general most essential concerning cattle-breeding in our district, and I leave it to the consideration of your honor to favor us perhaps at some other time with a visit.

With highest regards,

Oeconomierath BURKARDT,
President of the Agricultural Union.

CATTLE-BREEDING AT KIRCHBERG.

At Kirchberg, in the Black Forest section, great attention is paid to cattle-breeding, and several distinctive points of interest in connection with the subject will be found in the subjoined letter from Oeconomierath Schoffer, the president of the Royal Farming School at that point, who writes me, under date of October 22, as follows:

KIRCHBERG, NEAR SULZ, *October* 22, 1883.

In answer to your favor of the 19th of October I have to say that the breed of cattle stalled here is identical with that kept at the Royal Academy at Hohenheim, and that in regard to the rearing of young cattle only this difference exists, viz, that in Kirchberg a thorough system of grazing is carried out. Near the farm buildings there are two inclosures of about 3 hectares each, provided with facilities for watering the animals, where the young cattle, from spring (about May 10) until the end of October, graze without the supervision of herdsmen. So long, during spring and autumn, as the nights are cool and flies not troublesome the animals go out at dawn to graze, returning in the evening to their stalls, where they are daily washed. As soon, however, as the summer days grow warm and flies begin to be annoying, the animals are allowed to graze from 4 o'clock in the afternoon on through the whole night up to 8 o'clock in the morning, remaining during the daytime in the cool stalls. While there they are provided with as much corn-straw as they like—and this, during wet weather, they seem to prefer; no other fodder is given them in the stalls. The two grazing-grounds are ordinarily used alternately for four weeks at a time, so that the herbage gains strength before the cattle graze upon it. As soon as one inclosure has remained for some time idle the dung is carefully broken up and the weeds are mown off. Besides the dung of the grazing animals the grounds are only manured every few years with wood ashes. From the age of about six months up to the age of pregnancy, which is here about two and a half years, only the female cattle graze during summer, whilst the young males are cared for the same as at Hohenheim. A very strong bodily development and excellent health are found by an experience of thirty years to be the results of the above-described system of rearing by grazing.

This is the only feature distinguishing cattle-breeding here from that at Hohenheim, and I think that it would scarcely be worth while to come here personally, especially as at present the grazing is over with for this year.

With highest regards,

Oeconomierath SCHOFFER,
President of the K. Ackerbauschule.

CATTLE-BREEDING AT RAVENSBURG.

From Ravensburg, situated in the Swabian uplands near Lake Constance, in the southeasterly part of the Kingdom, it is reported in the last chamber of commerce report, as follows:

The new law about bulls will, without doubt, contribute very much to the improvement of cattle-breeding, although the poorness of the soil in Oberschwaben causes some difficulty and renders the keeping of township bulls almost impossible. It is to be hoped that through a better choice of bulls the brown cattle will be reserved to the Oberland, and will be able to resist successfully the encroachments of the parti-colored race as far as dairy uses are concerned. Where breeding prevails, the quicker growing parti-colored cattle are in their right place, and should be bred pure, whilst the aimless system of crossings between brown and red cattle, now prevailing in many places, should be opposed by every possible means. A further incentive to a better breeding and rearing of cows will be the higher price for the milk, obtained in many households and dairies in Oberschwaben through the introduction of the cold-water method, which we are glad to state is coming more and more into vogue. Only lately the dairy at Sigmarshofen was remodeled according to this system. The "Molkerei Genossenschaft" (dairy association) at Aichstetten also makes a very good showing in its last year's business.

CATTLE-BREEDING AT HEIDENHEIM.

From the district of Heidenheim, in the northeasterly part of the Kingdom, it is reported that the stock of cattle has both increased and improved during a series of years abundant in food, through a more general introduction of the Simmenthal blooded stock. In the district referred to there was founded in 1882 "die Molkerei Genossenschaft" (dairy association) at Gerstetten, numbering fifty-seven members, and producing daily from 1,100 liters of milk, 65 to 80 pounds of butter, and 150 to 160 pounds of cheese. The butter is sold to Ulm, Stuttgart, &c., and also somewhat to North Germany, the cheese principally to Ulm. From Rottweil it is reported that the condition of the cattle is satisfactory, and that in just recognition of its importance greater attention is directed to it from year to year. The race bred in the district has found a lively sale at good prices; unhappily many a fine young animal must be sold to meet the deficit caused by the bad prices of corn.

In the district of Heidenheim the total number of cattle brought to market in 1882 was, to the 12 fairs in Crailsheim, 3,793 head; the 12 in Ellwangen, 15,005 head; the 10 in Giengen, 5,701 head; the 13 in Gmund, 6,877 head.

Prices of Heidenheim cattle.

Cattle.	Markets.	Highest average price.		Lowest average price.	
		Month.	Price.	Month.	Price.
			Marks.		*Marks.*
Ox	Crailsheim	November	444.50	April	317.00
	Ellwangen	do	410.00	December	330.00
	Giengen	August and September	385.00	April	245.00
	Gmund	August	423.50	January	321.00
Bull	Crailsheim	do	243.50	October	175.00
	Ellwangen	March	315.00	July	285.00
	Giengen	September	213.00	April	180.00
	Gmund	do	262.50	February	235.00
Cow	Crailsheim	December	230.00	November	165.00
	Ellwangen	November	260.00	May	200.00
	Giengen	December	240.50	January	161.00
	Gmund	February	225.00	April	190.00
Heifer	Crailsheim	July	166.00	February	53.50
	Ellwangen	May and November	225.00	do	205.00
	Giegen	September	225.00	January	150.00
	Gmund	June	120.00	December	75.00
Yearling	Crailsheim*				
	Ellwangen*				
	Giengen	December	112.20	January	135 00
	Gmund	September and October	202.50	April	180 00

*Here the yearlings are not separated from the heifers.

AT HEILBRONN ON THE NECKAR.

In Heilbronn a district cattle exhibition took place from the 12th to the 14th of May, to which one hundred and twenty-nine exhibitors sent one hundred and seventy-one cattle, all more or less worthy of notice.

CATTLE TRANSPORT VIA THE ST. GOTHARD.

The chamber of commerce at Heilbronn reports that since the opening of the St. Gothard tunnel 100 to 300 oxen of the best quality have been sent from Italy to South Germany, costing per 100 pounds on the hoof only 20 to 30 marks ($5 to $7.50) in Milan and Alessandria, and bringing 38 to 42 marks ($9.50 to $10.50) in Mannheim and Frank-

fort. It is reported that the freight for these oxen, inclusive of 20 marks ($5) duty, amounts, from Milan to Mannheim, to 70 marks; consequently about 5 marks per hundred weight on the hoof, and the dealer, therefore, without calculating losses through accident, makes a gain of 3.5 marks per hundred weight, at which high rate of profit it seems probable that the dealer may have paid a portion of the duty.

But this new competition will not prove permanently dangerous, as the quality of the meat of the Italian ox does not come up to that of the ox raised in Wurtemberg, and does not keep so well. The low prices in Italy are ascribed to the fact that Austrian cattle are prohibited in Germany, and the fattened cattle from Austria, instead of going directly thither as formerly, are now said to pass first through Italy. On the other hand another very important element is to be noted in regard to our cattle trade, viz, the supplying of beef to the Parisian market from France exclusively, as has been the case for some time past.

CATTLE TRADE AT CALW.

From Calw it is reported: "The prices of cattle are everywhere good, and constitute, with hops, the principal source of income of the farmer. In consequence of the use of spoiled provender the hoof disease seems to have quite generally attacked the cattle. Although it is easily treated, it has yet caused great disturbance in the cattle trade. This trade has been a lively one during the entire year past, fat and fleshy cattle being always in demand and fat oxen, which form a principal article of export from the southwestern part of the Black Forest, being sold direct at the fairs and out of their stalls by the peasants to butchers and wholesale dealers. Milch cows and cows about to calve were also in demand and brought good prices.

CATTLE-FAIRS IN 1882.

To five cattle-fairs in Heilbronn were brought 92 bulls for breeding, 1,162 fattened oxen, 1,744 draft oxen, 2,212 bulls, 2,254 milch cows, 1,327 head of young cattle, 3,900 pigs, 126 horses. In Hall were brought to market 4,387 oxen, 3,026 cows, 3,269 head small cattle; whereof were sold 2,812 oxen, 1,663 cows, 1,860 head small cattle, with a total product of 1,756,393 marks. To the three cattle-fairs in Kunzelsau were brought 1,209, sold 400 head, with a product of 81,461 marks; average price per hundred weight on hoof: Fattened cattle, 36 marks; draft-cattle, 21 marks; young cattle, 18 marks. To the cattle-fair in Ehingen, 1,156 head were brought. At seven cattle-fairs in Calw were sold about 500 head of cattle, 300 to 400 horses, and about 1,500 pigs. In Nagold were sold 482 oxen, 853 cows and small cattle, 1,889 pigs, with a total produce of 339,307 marks. In Rottweil were brought to ten fairs, 796 horses, 2,805 oxen, 2,365 cows, 3,298 yearlings, 544 bulls, 160 goats, whereof there were sold on an average two-thirds.

CLIMATE OF WURTEMBERG.

The Kingdom of Wurtemberg lies at a varying elevation of from 135 to 1,151 meters (on the average 500 meters) above the level of the sea, and extends from 25° 32′ 20″ to 28° 9′ 36″ east longitude, and from 47° 35′ to 49° 35′ 30″ north latitude.

The mean temperature for the last ten years averaged + 6.7° Réaumur the year round; in spring, + 6.4°; summer, + 13.9°; autumn, + 6.9°, and in winter, — 0.2° R.

In regard to agriculture the climate ranges from "summer-corn" to "middling wine" climate, the "winter-corn" climate predominating. Spring begins in the latter part of March and lasts till the end of May, followed by three warm summer months. September and October are usually very sunny autumn months, while November forms the transition to winter, which in general is not severe or very snowy, on the contrary, often too mild and rainy. On the whole Wurtemberg, like all Western Europe, has milder winters and warmer summers than are to be expected according to its mean geographical latitude.

SOIL OF WURTEMBERG.

According to its geology and the character of its soil, which is intimately connected therewith, the country may be divided into the six following groups:

	Hectares.
Group 1. Colored sandstone	142,370
Group 2. Shell lime	661,514
Group 3. Red marls	261,614
Group 4. Black and brown jura	296,214
Group 5. White jura	327,284
Group 6. Tertiary sandstone	404,383
Area of the whole country	1,950,379

DISTRIBUTION OF AREA.

The entire area of the Kingdom is subdivided as follows:

Description.	Hectares.	Per cent.
Buildings, courts, streets, and roads	50,682	2.6
Cultivated lands	828,385	42.5
Meadows	277,860	14.2
Gardens and fields	38,295	2.0
Vineyards	26,135	1.3
Pasture land	84,130	4.3
Woodland	604,918	31.0
Streams, lakes, &c.	12,681	0.7
Barrens, quarries, marl pits, and sand pits	27,293	1.4
Total	1,950,379	100.0

MEAT SUPPLY OF WURTEMBERG.

The veterinary surgeon of Stuttgart reports that during the year 1882 there were slaughtered in the city limits the following number of animals, viz:

Description.	Number.	Total weight.	Average weight.
		Pounds.	*Pounds.*
Oxen	5,611	3,940,184	595
Bulls	524	327,419	624
Cows	750	299,500	399
Yearlings	7,093	2,205,124	324
Swine	24,807	3,512,481	141
Calves	40,980	.....	.....
Sheep	2,259	.....	.....
Total	81,724	.....	.....

No corresponding figures covering the entire Kingdom are obtainable, though an approximate estimate may be gained from the statement that Stuttgart's population is about one-seventeenth of that of all Wurtemberg. As above stated by Professor Dr. Vossler, of Hohenheim, much beef is exported, principally to France, to other parts of Germany, and to Switzerland. I learn further that some considerable quantities are sent as far as Belgium, and even across the channel to England.

MEAT PRICES AT STUTTGART.

I append herewith a statement showing the current prices at which the various kinds of meat are sold in the Stuttgart markets (week ending November 25), viz:

Description.	Quality.	Price per 100 pounds—		Retail price per kilogram (2 pounds).
		On the hoof.	Slaughtered.	
		Marks.	*Marks.*	*Marks.*
Beef	1	30 to 40	50 to 80	1.30 to 1.48
Do	2	20 to 36	40 to 72	1.16 to 1.48
Pork	1	46	61	1.40
Do	2	42	60	1.36
Veal	1	42	64	1.20
Do	2	38	62	1.16
Mutton	1	30	60	1.20
Do	2	20	40	.80

ASSOCIATION DAIRIES IN WURTEMBERG.

Agriculture is carried on in Wurtemberg chiefly by small farmers, and consequently, in the individual branches of agricultural production, the technical and economical advantages pertaining to farming, when carried on on a large scale, can only be enjoyed by the greater part of Wurtemberg agriculturists by means of association. For this reason efforts have been made for some years past to establish regularly organized associations among the rural population, with joint and separate guarantees to the members, and for the purpose of producing butter and cheese from milk. Up to the present time two such associations have been founded in Wurtemberg, concerning the origin, institution, and methods of which the following remarks furnish some explanation in connection with the accompanying regulations:

THE DAIRY ASSOCIATION AT AICHSTETTEN.

The borough of Aichstetten is situated on the southeastern frontier of Wurtemberg, in the county of Leutkirch (belonging to the Donaukreis), and distant only about 3 kilometers from the Bavarian frontier, on the little river Aitrach, and on the high road once much frequented from Leutkirch to Memmingen, in the Wurtemberg Allgau.

The altitude of the place being 600 meters and the Alps being near at hand, the climate is rather harsh, damp, foggy, and windy, and is especially marked by sudden changes of temperature, with frequent hoar and spring frosts and late springs. The conditions of the soil are, on the whole, favorable; but, as the climate is less so to the cultivation of commercial products and fruits, circumstances naturally suggest to the farmer chiefly the raising of provender for cattle and the cultivation of corn, and the deriving of the principal part of his revenue from the keeping of cattle.

Aichstetten numbered, on the 1st of December, 1880, 826 inhabitants. Its area comprises 1,441 hectares, of which 800 are arable land, 260 meadow, 21 pasture, and 360 wood.

The live stock amounted, according to the census of 1873, to 117 horses, 1,019 head cattle, and 120 swine. Sheep are not kept.

The classification of property of those citizens, numbering about 100, who chiefly occupy themselves with agriculture, is at present as follows: Farmers who own above 20 hectares are counted among the large proprietors; farmers with 10 to 20 hectares among the middling, and those under 10 hectares among the small ones. According to this division there are at present at Aichstetten twenty large, forty middling, and forty small proprietors. There are no large estates, properly so called; according to the rating generally prevailing, and especially in North Germany, concerning landed estates, the large proprietors would count among the middling, so that, according to this scale, only middling and small farmers are to be found at Aichstetten.

THE ASSOCIATION DAIRY AT ALLGAU.

Dairies have been established in the Allgau for a long time past, and there is considerable cheese manufactured, not ordinarily, however, by the farmers themselves, but by "cheesers" (Käser), to whom the farmers furnish the milk at a fixed price (for some years past at 8 to 9 pfennigs per liter), whilst the waste of buttermilk and whey is returned to the furnishers of the milk. Under these conditions, the sale of the milk has become more and more a matter of monopoly for the "Käser;" they fix the price of the milk, and the farmers have been able to do nothing against this one-sided arrangement, as the individual farms are mostly too small to enable their owners to manufacture their own cheese profitably, and, moreover, as, owing to the lack of larger towns in the vicinity, a direct sale of the milk is impossible. Besides, dairy management had not kept pace with recent improvements, and the preparation of butter had in many cases continued defective. A thorough improvement of these conditions could only be looked for by the formation of associations among the farmers, who would jointly and practically look after the making of butter and cheese. At the same time it was to be expected that the introduction of the principle of association into agriculture would exercise a favorable effect also on its other branches.

In order to attain the desired aim, it was first of all necessary to bring the new method of dairy management to the notice of the farmers in the Wurtembergish Allgau. An agricultural exhibition held at Leutkirch in the autumn of 1879, by the twelfth agricultural district association, offered the wished-for occasion. With it was connected a dairy exhibit, in which, at the expense of the royal centralstelle for agriculture, the making of butter and cheese after the latest methods (together with the separator-arrangement) was for a few days practically illustrated. This special exhibit aroused the highest interest among the great number of country people who attended. On the 28th of September, eight resident farmers, owning 152 cows in all, resolved upon the founding of an association for the common handling and sale of the milk, and charged a committee with the preliminaries for the establishment of a dairy building of their own. But various obstacles caused delay, and it was not until the 29th of January, 1880, that the association was definitely organized as "The Würtembergische Molkerei *Aichstetten*, eingetragene Genossenschaft" (registered association).

The principal obstacle vanished when a copious supply of fresh spring-water was found at an easy depth and attaining even in the hottest summer weather a temperature of not over 10° Celsius. This valuable discovery necessitated the construction of a pump work; but as heating by steam also recommended itself as cheaper, cleaner, and more easily regulated, it was decided to purchase a boiler of six atmospheres and a motor of 4-horse power. The latter pumps water and works the churn, while the steam heats the cheese-vat and warms the entire building. In the cellars especially has the moist, equalized warmth engendered by steam-heating proved unusually favorable to the ripening of the cheese.

Upon entering the dairy building, which is built in a pleasing style on a small hill in the center of the village, and forms one of its ornaments, we first come to the vestibule, which serves at the same time for the reception of the milk. According to the regulations milk must be delivered unstrained, as in this state the presence of foreign substances and of impurities can be much more easily detected. It is twice strained, then weighed, and the quantity delivered by each furnisher is credited in his milk-book and also in the register of the association. In the vestibule are also a number of test-glasses, used in determining the percentage of cream which the milk of each furnisher contains.

At the left of the lobby we enter "das Aufrahmungslokal," a high and well ventilated hall, provided with long cement troughs sunk in the floor. In these the milk vessels, containing 40 liters each, are placed on lath-racks; the capacity of cooling-troughs is 2,300 liters. The water for feeding them is pumped into cast-iron reservoirs, which are under the roof.

During the first one and one-half to two hours the water is allowed to flow in and run off with full force, after which no further flow is necessary. According to the method of Swarz the principal process of extracting the cream takes place after two hours and is finished in twenty-four hours; any farther extraction of the cream is avoided, as otherwise the cheese loses in weight and becomes thin.

The cream, which is taken off after twenty-four hours, remains for another twelve hours in cold water, so that it is put into the churn with a temperature of 10° Celsius. The churn used is an improved Lehfeldt "Rollbutterfass," from the "Centralmolkereimagazin" of F. H. Schmidt, at Munchen. It contains 250 liters of cream and can turn out 50 pounds of butter at a time. The churning process requires forty-five minutes; the butter is taken out of the churn at 12° Celsius, is left for an hour in fresh water, and then put under the kneading machine. The kneaded butter is then made into rolls of 1 pound each, which are marked with the stamp of the association, packed in wet parchment paper, and then again placed for an hour in quite cold water, after which they are shipped away by post in boxes of 4½ kilograms each. The Aichstetten butter has grown greatly in favor on account of its fine taste and of its keeping well. The daily shipment amounts to 75 kilograms, and the demand cannot be supplied. A yield of 3¼ to 3½ kilograms of butter from 100 kilograms of milk is about the highest result obtained.

At the right of the lobby there is the "Käsereilokal," where stands a cheese-vat with a capacity of 1,000 liters. It is of wood, copper-bottomed, and warmed by steam from below. In manufacturing "Backstein cheese" the skimmed milk warmed to 33° Celsius is curdled with liquid rennet. The Aichstetten "Backstein" cheese is distinguished, besides its good appearance, by its excellent taste, and, in spite of its being less rich, always brings the highest prices paid for this sort of cheese.

Besides "Backstein" cheese round cheese (Rundkäse) is manufactured. Also here the milk is curdled at 33° Celsius and worked to 40° Celsius.

Round cheese is sold at present at 80 pfennigs; "Backstein" cheese at 60 pfennigs, and butter at 2.20 to 2.40 marks per kilogram, while peasants' butter sells only at 1.60 marks. The yield of cheese amounts from 9 to 10 kilograms of Backstein, and a little less round cheese, from every 100 kilograms of milk.

The whey is given to the milk furnishers, who take back on every 3 kilograms of furnished milk 2 kilograms of whey, and on every 10 kilograms of milk 1 kilogram of buttermilk, which remains perfectly sweet.

From the "Käsereilokal," in which, besides the cheese-vat, are placed the butter kneader, the stretching table, and the press, we come to the machine hall, where, in addition to the horizontal steam engine, the pump and the churn are placed. In a separate room stands the boiler, which is heated with Ruhr lump coals. The daily consumption of coal is 2 centners, which, at Aichstetten, costs 1½ marks per centner. The entire space underneath is occupied by the cheese cellars, which are high and well ventilated and fulfill all the necessary conditions for the proper ripening of the cheese.

The whole establishment, with its carefully-scoured cement floors, and the cleanliness prevailing everywhere, gives a very favorable impression, as compared with the old, smoke-blackened, cheese-kitchens of the Allgau district.

Under the roof are apartments for the cheese-maker and the apprentices, and room for storing wood, &c.

The dairy was opened on the 5th of July, 1880. The entire plant cost 25,628 marks, the chief items of which are the building, 11,710 marks; the steam-engine, the boiler, and the fountain, 7,255 marks; the interior fittings, 4,539 marks; the ice cellar, 707 marks, and sundries, 1,364 marks. To cover these outlays a loan was raised under the joint and individual guarantee of all the members of the association. According to section 12 of the statutes, on every kilogram of milk furnished to the dairy 1 pfennig is due to the treasury of the association. One-half of the money thus raised is applied to payment of interest and the canceling of the loan, while the other half goes to defraying current expenses and to the accumulation of a reserve fund. On every kilogram of furnished milk members receive on account 9 pfennigs; whatever beyond that is obtained by the management is paid to them yearly as their share of the profit, after the deduction of all charges. The quantity of milk daily used averages 1,500 kilograms. The price per kilogram amounts to 12½ pfennigs, without the whey. Every kilogram is taxed 1.3 pfennigs for the expenses of the association.

This new enterprise, to which His Majesty the King, upon the suggestion of the ministry of the interior, has granted a considerable subsidy from the fund of the royal centralstelle for agriculture, shows, after almost two years of existence, a steady, thrifty progress. As the best proof of the recognition it finds among the people it may be stated that the membership of the association has increased from eight to thirty, owning in all two hundred and eighty-five cows. The association exercises, both directly or indirectly, a salutary influence upon the revenue of its members, who thus obtain an assured and more profitable sale of their milk, while the growing of provender and breeding of cattle are improved. *But not less* important is the favorable influence which such an association may exercise in a moral point of view on its members as well

as on the whole community through the fact that working and caring for a common enterprise draws men nearer to one another and teaches them the better to agree together. The system and cleanliness indispensable in the dairy business find their way by and by into the stalls of the cattle and the dwellings of the families, bringing with them all their blessed sanitary benefits.

THE DAIRY ASSOCIATION AT HELDENFINGEN.

Sooner than might have been expected the example of Aichstetten has been followed and a second Wurtemberg Dairy Association has been organized at Heldenfingen.

The village of Heldenfingen is situated near the eastern frontier of Wurtemberg, in the county of Heidenheim, belonging to the Jagst district, on the elevated plateau of the Swabian Alps, about 650 meters above the sea. Its climate is severe, belonging to the zone of winter-corn, windy, rather dry, less favorable in general to the growth of commercial products and fruits. The soil is a strong, calcareous, clayey one, the product of the disintegration of the white Jura, partly flat, stony, and frequently too dry, as the surface water is quickly absorbed.

Heldenfingen has 830 inhabitants, owning in all an area of 950 hectares, used for agricultural purposes; there are 880 hectares arable land, 30 hectares meadows, and 40 hectares pasture land.

The stock of cattle amounted on the 1st of April, 1881, to 55 horses, 531 head of cattle, and 80 swine.

The distribution of the property in areas is as follows: The greatest proprietor has 60 hectares; seven great proprietors have each 30 to 50 hectares; twenty middling proprietors have each 10 to 30 hectares, and one hundred and fifty-seven small proprietors have each under 10 hectares.

This shows that small proprietors are in a large majority in Heldenfingen, and that real estate is here still more divided up than it is in Aichstetten. Under these circumstances greater results in point of economy can only be obtained through the association plan.

In Heldenfingen, as in the whole Wurtembergish Alps region, the cultivation of corn has occupied hitherto by far the greater area and constituted the principal source of income of the farmer. Although the stock of cattle has been considerably improved in the last decades by the increased growth of clover, which is especially important on account of the small area of meadow land, yet the farmer could not reap the full benefit of it, as the direct sale of milk was impossible, owing to the distance from larger towns and the railroad, and dairy management was unknown or confined to the preparation of an inferior quality of butter, which had to be sold at correspondingly low prices (1.50 marks per kilogram).

Whilst Aichstetten is situated in a locality where dairy management has been in vogue for a long time and forms the most important branch of agricultural industry, so that the question there consisted merely in an essential improvement of an already existing branch of trade, the improved dairy system as introduced in Heldenfingen was for that place quite a new branch and one hitherto unknown there.

The first impulse to it was given in Heldenfingen in the autumn of 1881 through a lecture delivered by the itinerant instructor in agriculture for the Jagst district concerning the recent progress made in dairy matters and the higher yield of milk consequently to be obtained through the association plan.

In the lecture it was also pointed out that one of the most important conditions for the successful management of a dairy, viz, pure, fresh water, now existed through the parish of Heldenfingen having but a short time before joined the rough Alps water-works system, thereby receiving good spring water in abundance from the pumping station in the Eyb Valley, near Geislingen, 29 kilometers distant.

On the 5th of December, 1880, thirty farmers resolved upon founding an association for the common handling and sale of milk, and charged a committee of five members with the work necessary for the carrying out of the resolution.

The members of the committee, under the guidance of the president of the association, Schultheiss Bosch, visited the dairy at Aichstetten, and from the favorable impression thus derived soon agreed to establish a similar institution in Heldenfingen, and in so doing to profit by the experiences gained at Aichstetten.

But as there, so also at Heldenfingen, the final realization of the enterprise encountered various difficulties. Doubt as to the usefulness and profitableness of the business took more and more hold upon not only the adversaries, but also upon those who had hitherto been friends of the project, and the president of the association very properly reported to the Royal Centralstelle for agriculture in regard to the discord among the members of the association that "a regular April shower had occurred, followed by heavy spring storms."

But when the members' disposition had finally grown more favorable it was found possible to commence building in June, 1880, and the dairy was opened on the 10th of October, 1881.

The dairy building is neat in style, and is constructed like that at Aichstetten, according to the newest plans, but is more spacious in dimensions. It has the necessary facilities for the Swarz skimming method, for the working of the cheesery by steam, and for the steam heating of all the rooms. The total cost for building and construction amounts to 24,000 marks, viz:

	Marks.
For the building of the house, inclusive of the purchase of the building lot..	14,000
For boiler, 5 steam stoves, steam and water pipes, dairy constructions.....	6,000
For the ice cellar, water reservoir for cooling water with ice, construction of an elevator in the cheese cellar, fencing in of the ground, &c.....	4,000

To meet these expenses a loan was raised under the joint and individual guarantee of all the members, the interest on which is paid, and the cancellation of which takes place according to the statutes hereafter printed, on the same safe basis as at Aichstetten, 1 pfennig on every kilogram of milk furnished being first withheld for the treasury of the association.

A water pump was not required in this dairy, as the water from the pipes of the rough Alps water-works rises by its own pressure as high as the upper rooms of the building. The water has in winter a temperature of 6° Celsius, in summer of 10° Celsius, and must therefore in the latter season, through the use of ice, be cooled to its winter temperature.

The new dairy at Heldenfingen may be considered a gratifying result of the establishment of the Alps water-works, built by the aid of the Government, for otherwise the former lack of water in that region would have rendered the idea of founding a larger dairy impossible.*

As at Aichstetten, the making of fine table butter and of good Backstein cheese is the aim of the management.

*See report on water-works in rough Alps, Consular Reports, No. 10, p. 268.

The thirty members, among whom there are seven large, twelve middling, and eleven small proprietors, own in all one hundred and twenty milch cows, consequently only four cows on an average to each, while at Aichstetten there is an average of twelve cows to each. Some larger partners furnish the dairy 65 to 70 kilograms of milk daily, the smallest only 6 kilograms, showing that the new enterprise offers even to the smallest producer an opportunity of profitably selling his milk, an opportunity which he formerly lacked entirely.

At first 650 kilograms of milk were handled daily, from which about 21 kilograms of butter and 50 kilograms of Backstein cheese were obtained; but arrangements have been made looking to the handling of 1,300 kilograms of milk daily. The butter and cheese are of an excellent quality, and the former finds a ready sale at 2.20 marks (whilst ordinary peasants' butter brings only 1.50 marks), the latter at 60 to 70 pfennigs per kilogram. The butter, like that from Aichstetten, is shipped principally to Berlin, Leipsig, Stuttgart, and other large towns. Members receive for every kilogram of furnished milk 8 pfennigs; what is obtained beyond that is, after the deduction of all expenses, yearly divided in shares of profit.

To this enterprise also His Majesty the King has, upon the suggestion of the ministry of the interior, granted a considerable subsidy from the funds of the Centralstelle for agriculture.

Whoever enters the dairy premises and notes the cleanliness and systematic detail everywhere prevailing gains an extremely favorable impression of the new enterprise. One can well understand why the people of Heldenfingen speak with some pride of their dairy, which in the whole neighborhood and even beyond wins a name for the quiet Alpine village and promises to become a source of material welfare for its inhabitants.

CONCLUSION.

The latitude given by the circular of instruction calling for this report has enabled me to cover a wide range of subjects, and to go into details and statistics which I trust will prove of value to American stock-breeders and those engaged in kindred pursuits. As has been already stated, Wurtemberg is the leading German state in these branches of agriculture, and the subject therefore derives an increased importance for this consular district. As appendices to my report will be found:

Translation of a decree (June 16, 1882), from the ministry of the interior providing for the carrying out of the law in regard to bull-keeping.*

Translation of the statutes of the Dairy Association, (registered company at Heldenfingen.*

Table showing cost, expenses, and outlays of bull-keeping at Kirchheim, under Teck.†

Table showing the percentage of area in each geological group, and in the entire Kingdom of Wurtemberg subdivided as regards cultivation.

Table showing the percentage of each of the various kinds of products raised upon the arable surface of each group, and of the entire Kingdom.

The characteristics, productiveness, &c., of the Simmenthaler and Allgauer breeds of cattle, and their respective crossings.

I also forward as inclosures, &c., accompanying this report, and illustrative of it, the following:

Six models (in *papier maché*) of breeds of cows mentioned in the report, viz:

(1) Simmenthaler; (2) Allgauer; (3) Sähwebisch Haller; (4) Limburger; (5) Alb; (6) Neckar.

* Published in the supplement.

† Published in body of report, as inserted by the consul.

"Hohenheim Thier Album," being a collection of twelve photographs of animals of the various breeds, taken from life.
"Die Racen des Rindes," an illustrated work by Dr. von Rueff, late director of the veterinary school at Stuttgart.
Photograph of the Royal Agricultural School at Hohenheim (near Stuttgart).
Official copy of the law providing for the keeping of township bulls in Wurtemberg.
Plan of the royal domain at Kirchberg, Wurtemberg.

I desire to express my obligations to Professor Dr. Vossler of the Royal Agricultural School at Hohenheim, to Assessor Zeeb, of the Royal Centralstelle for agriculture, to Oberamtmann Loeflund, president of the District Agricultural Association at Kirchheim under Teck, and to Dr. von Rueff, late director of the veterinary school at Stuttgart, for valuable information furnished me in the preparation of this report.

GEORGE L. CATLIN,
Consul.

UNITED STATES CONSULATE,
Stuttgart, November 28, 1883.

Table showing the percentage of area in each geological group, and in the entire Kingdom of Wurtemberg, subdivided as regards cultivation.

Description.	I.—Colored sandstone.	II.—Shell-lime.	III.—Red marls.	IV.—Black and brown jura.	V.—White jura.	VI.—Tertiary sandstone.	Percentage of the entire Kingdom.
Buildings, courts, and roads	2.52	2.05	3.00	2.72	1.82	2.31	2.6
Cultivated land	22.73	52.61	30.11	40.90	46.77	48.05	42.5
Meadows	7.49	12.14	15.17	18.07	6.69	17.48	14.2
Gardens and fields	1.10	1.90	2.42	3.10	1.05	1.81	2.0
Vineyards	0.15	2.75	3.64	0.55	0.05	0.10	1.3
Woods	62.61	23.20	39.47	26.24	32.79	24.95	31.0
Streams, lakes, &c	0.33	0.59	0.67	0.49	0.18	1.23	0.7
Pasture land	3.07	3.86	5.52	7.03	10.65	4.07	4.3
Barrens, quarries							5.7
Marl and sand-pits							1.4
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.0

Table showing the percentage of each of the various kinds of products raised upon the arable surface of each of the above groups, and of the entire Kingdom.

Description.	Group I.—82,235 hectares.	Group II.—272,813 hectares.	Group III.—78,777 hectares.	Group IV.—123,165 hectares.	Group V.—153,043 hectares.	Group VI.—170,257 hectares.	Entire Kingdom—828,285 hectares.
	Per ct.	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
Winter-spelt	15.40	21.98	22.65	26.63	23.42	25.90	23.64
Oats	17.98	12.49	13.72	16.15	18.84	14.44	14.90
Barley	2.73	11.23	8.98	10.11	9.44	13.42	10.76
Other winter and summer corn	12.21	11.90	14.22	8.89	8.36	9.17	10.43
Clover, lucern, &c	9.45	10.62	9.38	9.09	10.76	12.00	10.60
Potatoes	11.90	8.63	11.29	9.98	5.36	5.53	7.88
Marketable products, hops, tobacco, &c	3.22	4.52	3.86	3.70	2.03	3.99	3.73
Esculenta, red beets, sweet turnips, cabbage, &c	3.46	4.79	3.89	3.30	2.16	2.73	3.49
Beans, peas, and green corn	2.07	3.97	3.08	2.53	2.28	2.58	2.90
Fallow ground	21.58	9.97	8.93	9.62	17.35	10.39	11.67
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

CHARACTERISTICS OF WURTEMBERG CATTLE.

The characteristics, productiveness, &c., of the Simmenthaler and Allgäuer breeds of cattle and their respective crossings are as follows:

Simmenthaler and crossings.—Their color is red and yellowish brown; brown and white speckled, and wheat-bread colored. The head is strong and broad; neck short and broad; horns often rather heavy; back straight; caudal bone often high; belly deep and well rounded; chest wide; legs well formed and strong. Bred pure in Hohenheim since 1835. Origin, Canton Bern, Switzerland. This breed arrive at maturity at three years of age, when the weight of meat is from 48 to 60 per cent. of live weight. They are excellent for draft purposes and capable of doing a large amount of work. The meat is rather coarse fibered, but good. The size of the cow at maturity is as follows: Height, 1.45 meters; length, 2.24 meters; haunches, .66 meter. The bull: Height, 1.50 meters; length, 2.30 meters; haunches, .68 meter. The ox varies greatly. The weight of the cow is from 350 to 700 kilograms; bull, from 500 to 1,000 kilograms; ox, 500 to 1,000 kilograms. The annual average product of milk is from 2,000 to 2,500 kilograms, of excellent quality, 25 to 30 kilograms producing 1 pound of butter. Cheese of excellent quality is made; 11 kilograms of milk producing 1 kilogram of cheese.

Allgauer and crossings,—Brown, grayish brown, with light streaks around the mouth and over the back. Fine bone; the body small, but well shaped; head short and broad; horns, light; back straight; legs well formed. Originally from the western part of the Tyrol. Mature at three years of age, when the weight of meat is from 50 to 60 per cent. of live weight. Good powers of endurance. The meat is finer than the Simmenthaler. Their size is as follows: Cow, 1.24 meters high; 1.94 meters long, and haunches, .54 meter; bull, 1.40 meters high; 2 meters long, and haunches .60 meter; ox, varing greatly. Weight: cow, 300 to 500 kilograms; bull, 400 to 700 kilograms; ox, 400 to 600 kilograms. The annual average production of milk is from 2,100 to 2,400 kilograms; 20 to 22 kilograms producing 1 kilogram of butter; 9 kilograms of milk producing 1 kilogram of cheese. The milk and cheese are of very good quality.

CATTLE BREEDS OF BADEN.

REPORT BY CONSUL BALLOW, OF KEHL.

The three best varieties of cattle existing in the Grand Duchy of Baden are the Messkirch cattle, the Baar cattle, and the Black Forest cattle.

MESSKIRCH CATTLE.

The finest breed of Baden is the Messkirch cattle.

The district of Messkirch belongs to that hilly part of Southern Baden which extends from the Lake of Constance to the Swabian Alp. The chief town of this district is Messkirch, with 2,000 inhabitants. The Swabian Alp, with parts of the Black Forest, forms a plateau which is called the Heuberg. This chain of hills has an altitude of about 2,000 feet above the level of the sea. The soil consists, principally, of gray and yellowish limestone. There is a great scarcity of water, on account of the many crevasses in the ground, which absorb the rains and prevent the formation of sources. The climate is that of an unsheltered highland. The height of the barometer is 26.3 Paris inches. The average temperature during the year is +6.35° Celsius; the warmest month is July, with an average temperature of +15.26° Celsius; the coldest month is January, with —2.67° C. From the foregoing it will be seen that the climate is quite severe, but, notwithstanding, it is advantageous for cattle-breeding. This circumstance is attributed to the calciferous nature of the ground. The original cattle of

the Messkirch district were small, of a fine structure, red in color, short but pointed head, and strong, short horns. They were very productive in milk, and frugal regarding their fodder. Toward the year 1830, however, the stock-breeders began to import bulls from the Swiss cantons of Zurich and Schwytz, and soon a great change was observed. This was first done in Messkirch, but the example was immediately followed by all stock-breeders in the whole district, so that twenty-five years afterward the Swabian Alp cattle had very nearly disappeared. The variety obtained by this interbreeding is distinguished by its great fleshiness, abundance in milk on the one hand, and strength and endurance for labor on the other. The importation of cows from Switzerland did not have good results; they did not become used to the climate. The number of cows in the Messkirch district was 5,000 in 1880, and 76 bulls. These bulls are the property of the community, which pays for feeding and attendance. Even the stables where these animals are kept belong to the community. The Government prescribes that one bull must be kept for every eighty cows. The inspection of the bulls in 1882 in the Messkirch district gave the following result:

Among seventy-six bulls there were—

First-class (very good)	35
Second-class (good)	30
Third-class (proper for breeding, but of ugly shape)	10
Fourth-class (unfit for breeding, with defective constitution)	1

As a rule cows are covered for the first time at the age of one and a half years, and calve generally at two and a quarter years. Cows which calve before they have reached their full growth never become very strong nor productive in milk. The inclosed photographs, for which I am indebted to the courtesy of his excellency the state minister of the Grand Duchy of Baden, are all of the Messkirch breed and show to good advantage their build &c.; they were purposely obtained for this report, and are good average specimens of these cattle.

PECULIARITIES OF THE MESSKIRCH CATTLE.

The Messkirch cattle are nearly all checkered; the different kinds are:

(1) Yellow checkered, light yellow or dark yellow on the back with irregular, clearly defined white spots.

(2) Red checkered, hair on the back red, mostly red or yellowish, sometimes dark red with dim white spots.

(3) White checkered, white back, flanks red hair, head and feet white.

Besides these there are animals which are either all red or all yellow, the head is white, some have little yellow or red spots around the eyes. Statistical comparisons made in 1873 show that the yellow and red checkered color is most prevalent in the Messkirch district.

The nostrils, the same as the membranes of the mouth-cavity, are without color; the horns and hoofs are yellow, resembling wax. The tuft of hair over the ears is of the same color as the hair on the back. The end of the tail is mostly white. Black or brown spots on the nostrils are marks of the descent from the original Swabian Alp cattle.

Red or yellow checkered animals with white head, yellow horns and hoofs, colorless nostrils, and white end of tail are most frequent in the Messkirch district.

SIZE AND WEIGHT.

Size and weight of all breeds of cattle vary considerably; the Messkirch breed are no exception to this rule. Animals which get good and abundant food will be much heavier in weight than those whose food is insufficient. The following table will show the average sizes obtained by actual measurement:

Kind.	Number of animals.	Average height.	Average length.
		Ft. in.	Ft. in.
Cows	50	4 2	5 1
Oxen	20	4 4	5 0
Female calves (yearlings)	30	3 10	4 6

The measurement of eighty animals at maturity gave average height, 4 feet 1 inch; length, 4 feet 10 inches.

The weight is as follows:

	Pounds.
Calves at the time of their birth	70 to 85
Animals of one year	430 670
Animals of two years	776 1,030
Cows reach a weight of	900 1,400
Oxen reach a weight of	1,100 1,300
Bulls reach a weight of	1,800 2,400

MEASURES OF SEPARATE LIMBS.

The length of the neck is on an average 1 foot 2 inches. The skin of the neck is fine and wrinkled. The withers are large and round, and are in a horizontal direction with healthy animals. The loins have an average length of 14 inches.

Average measurement of different parts of animals.

Kind.	Number of each measured.	Head between the horns from frontal bone to cleft of lip.	Width of forehead between the temples.	Length of back from shoulder to last rib.	Length of shoulder.
		Ft. in.	Inches.	Inches.	Inches.
Cows	10	1 8	7	22	20
Female calves	16	1 7	6	20	18
Bulls	9	1 9	8	21	21

BREEDING AND FEEDING.

By far the greater number of the calves that are born each year are raised; the price is invariably high, so that the butchers are often obliged to take their supply from other sections. Some of the male calves are sold after twelve or fifteen months for breeding; the majority of the males, however, are castrated after six or eight weeks and sold after two years or kept for labor.

Most of the Messkirch stock-breeders let the calves (male as well as female) suck during six or eight weeks. After that time the calf gets

sweet creamed milk with some corn-meal in it, and a little hay; this is continued for six months, then the calf gets, during three months, hay and water mixed with salt and corn-meal.

In winter the food of the grown-up cattle consists of hay, chopped straw, and beets; twice a week they get a mixture of malt and oil-cake. The cattle of the small farmers are mostly fed upon straw and very little hay and very often on beets. In summer the food consists of Swedish and lucern clover. The stables are very defective and unhealthy for the cattle. The greater part are too low, too small, and often overcrowded. Good and spacious stables with excellent ventilation are found on the large farms. The temperature in the stables of the little old farm houses is always too warm, but notwithstanding, the health of these cattle is excellent; this is partly explained by the fact that they are used to poor quarters; it also demonstrates that they are very hardy stock and do better under such circumstances than any other breed of cattle.

MEAT PRODUCTION AND FATTENING.

Calves which are sold three or four weeks after their birth to butchers, have a live weight of 100 to 120 pounds; calves which suck good milk have a weight of from 250 to 300 pounds after two to three months. The average price paid for calves by butchers is as follows: calves from three to four weeks old, $10; two to three months old, $30; three to four months old, $45.

An ox of first quality, having a weight of 1,500 pounds, produces 840 pounds of meat, 120 pounds of tallow, 100 pounds skin, and 100 pounds must be deducted for the head, feet, and bowels.

An ox of second quality produces 680 pounds of meat, 60 pounds of tallow, 100 pounds skin.

A cow of first quality, of a live weight of 1,300 pounds, produces 680 pounds of meat, 90 pounds skin, 100 pounds of tallow.

A cow of second quality produces 550 pounds of meat, 80 pounds of tallow, 90 pounds skin.

The average is about 103 pounds of meat to 200 pounds live weight.

MILK PRODUCTION.

In the years named eighteen cows produced the following:

Years.	Quantity of milk.	Price per liter.	Total value.
	Liters.	*Cents.*	
1878	27,100	4	$1,084
1879	26,138	3½	915
1880	27,422	3½	950
Total	80,660		2,949

From this must be deducted milk used in the house, 3,285 liters, milk for food of sixteen calves which are born on an average in a year, at 1½ gallon a day during two months, 5,760 liters, leaving a total of 71,615 liters or 17,904 gallons.

A cow of the Messkirch breed produces each day on an average 1¼ gallons of milk, or 540 gallons a year in three hundred milk days.

The specific gravity of the milk, fresh from the cow, is from 29 to 33 per cent. After twenty-four hours the cream shows 10 to 12 per cent.

One and one-fourth gallons of milk furnish 1 pound of cheese; 6 gallons (24 liters) give 2 pounds of butter. In regard to milk production the Messkirch breed is not inferior to any of the best milk-producing breeds of Austria and Tyrol.

EXHIBITIONS OF CATTLE AND MARKETS.

At the International Cattle Exhibition at Vienna in 1873 the medal of progress was awarded to the Agricultural Association of Messkirch for the exhibition of twenty young cows and two bulls. At an exhibition in Mannheim in 1869 the above-named association obtained the first prize for a collection of the best breeding-cattle. Markets are held the first of every month in the cities of Messkirch, Pfullendorf, and Stettin. In 1880 there were sold at these markets about eight hundred and seventy oxen and cows and about sixteen hundred young cows. The Messkirch cattle have already found favor in several foreign countries. A great many young cattle are sold every year to the stock-breeders in Alsace, Wurtemberg, and even in Switzerland. Cows sell from $70 to $150, bulls from $70 to $100, and calves, from two to four months, for $15 to $25.

THE BAAR CATTLE.

The district called the Baar is a plateau in Eastern Baden, which is bounded on the north by the Black Forest, northeast by the Neckar, south by the Swiss Jura, and west by the Wutach Valley. This plateau extends from north with a slight descent towards the south. In the northern part of this plateau, extending in a southern direction, there are three parallel chains of mountains; The eastern chain is a branch of the Black Forest, and consists principally of limestone, with narrow strips of anhydrite; the middle chain commences at Donaueschingen, where the sources of the Danube are, and ends at Doggingen. These mountains consist mostly of shell-lime and dolomite. The western chain, which commences at Hochemmingen, in Wurtemberg, is of siliceous nature. At the foot of these three chains of hills commences a plain with rich meadows, which are abundantly watered by many little water-courses. This part of the Baar is one of the most fertile districts of Baden. The altitude of this plateau above the level of the sea is from 2,100 to 2,400 feet.

The Baar cattle are a checkered cattle; they are red, light red, and yellowish in color, mixed with white. The red spots are mostly on the back, neck, shoulders, flanks, and shanks. The breast, belly, and legs are generally white. The skin in general is colorless; the horns and hoofs are light yellow. The size of this variety is not always the same; in some parts of the district the oxen are much stronger and larger than in others, while the difference in the size of cows is not so considerable. The average height obtained by measuring thirty animals was: cows, 4 feet 1 inch; oxen, 4 feet 7 inches; bulls, 4 feet 4 inches. The length taken from the top of the shoulder to the upper part of the thigh is: cows, 5 feet; oxen, 5 feet 2 inches; bulls, 5 feet 2 inches. The height is consequently 81 per cent. of their length. The head of the Baar cattle is broad, strong, and bony. The forehead is straight, smooth, and without any cavities; it measures between the horns 8 to 9 inches, on the temples 9 to 10 inches. The upper end of the forehead is heavily covered with hair, which spreads downwards in the form of a semi-circle. The length of the forehead is 10 inches. The total length of the head is 1 foot 8 inches. The ears are straight, and stand in a horizontal posi-

tion. The eyes are lively; the glance is clear, quiet, and attentive; the iris is of nice brown color. The nape is strong. The back is strong and muscular, but has the disadvantage of being somewhat too low and deep; the Badish veterinarians claim that this is caused by defective feeding during the time after the ablactation, and by the fact that the crib is placed too high for the young animals. The length of the back is: cows, 4 feet; oxen, 4 feet 1 inch; bulls, 4 feet 4 inches. The skin of the Baar cattle is rough and thick; it is a good tanning material on account of its durability.

The live weight of cows is from 1,000 to 2,000 pounds; oxen, which are not fattened, weigh 1,200 to 1,400 pounds; bulls reach a weight of 2,000 pounds. The sizes of the animals vary according to the section of country where they were raised, and the food and attendance which has been given to them.

The best and largest animals of the Baar cattle are to be found in the villages of Mundelfingen, Pfohren, Aasen, Sundthausen, Geisingen, and Unadingen, which are the central points of the breed. Twenty years ago they commenced introducing this breed into the Black Forest district, and it has flourished in the limestone section of this range of hills, but in the red sandstone district it has not done well, and few, if any, of these cattle are now to be found in that section.

The food and manner of feeding the calves is the same as with the Messkirch cattle. In summer the grown-up cattle are fed on clover, lucern, and esparcet grass. One-half of all the cattle are driven to the pastures. In winter the food consistsof hay, straw, beets, lentils, &c. Oxen that are worked get mostly chopped straw and beets. In summer the animals are fed three times a day, in winter twice.

The different kinds of fodder cultivated in the Baar district are, the red clover, the white clover, and other grasses, such as *Lolium perenne*, *Italicum*, *Avena elatior*, *Dactylis glomerata*. Lucern and esparcet are cultivated on a large scale, as they furnish three crops a year. It is a general custom in this district to grow fodder plants on a field during two years, and to plant it with corn or barley the third year.

STABLES.

The stables are usually connected with the barns and dwelling houses. The height of the stables is on an average 8 feet, the width 10 feet; the length depends upon the number of cattle. The floors are mostly of wood; underneath the floor there are pits or reservoirs to receive the urine. Those stables I have seen were insufficiently ventilated and lighted. Cribs and racks are made of wood.

MILK PRODUCTION.

The cows of the Baar cattle are very abundant in milk. The average quantity produced by a middle-sized cow is 2,100 liters or 520 gallons per year. A cow specially fed is able to produce 2,600 liters, or 600 gallons. Three gallons of milk furnish 1 pound of butter, and 1½ gallons produce 1 pound of cheese.

FATTENING.

The fattening has of late not made much progress, because cheap food, such as the distilleries and sugar factories can furnish, was scarce, and the existing breweries could not produce all the material required.

Another cause was the poor crops. The fattening of the oxen commences after three to four years. They fatten very easily; the back, the loins and the shanks are very fleshy. The meat, especially of animals which were not used for labor, is soft, succulent, and of excellent taste. The weight of the meat in proportion to the live weight is 60 per cent.

The Baar cattle are much used for labor, for the Baar district consists mostly of small farms and the farmers prefer oxen to horses for plowing the fields. The bony, strong, and stout constitution, the strong back and muscular legs, together with its safe gait, make the Baar cattle very useful for labor. Two oxen usually suffice to draw a plow.

The Baar cattle have been exported to different sections of Germany, where they have thriven well. They require less food and attendance than the Swiss cattle from the Canton Bern, from which the Baar cattle descends. For instance, trials having been made to keep Baar cows in the Black Forest have had good success, while the same trials made with Swiss cattle have entirely failed.

NUMBER OF CATTLE IN THE BAAR DISTRICT.

The number of cattle existing in the Baar district is 27,000 head. The percentage of the live stock as to age and sex, is as follows:

	Per cent.
Cows	39.7
Young cows over 1½ years	9.2
Oxen over 1½ years	15.5
Cows from 3 to 12 months	13.0
Oxen from 3 to 12 months	11.6
Calves less than 3 months old	9.0
Bulls over 1½ years	0.8
Bulls less than 1½ years	0.6

PRICES OF BAAR CATTLE.

Cows are worth from $57 to $120; pregnant cows from two to three years, $60 to $100; oxen from three to four years, $70 to $120; bulls, $60 to $90.

THE BLACK FOREST CATTLE.

The Black Forest variety exists all over these mountains, and can be called the proper original Baden cattle, except in a few districts contiguous to Switzerland, where they have been mixed with Swiss cattle. The first impression these animals make is not a good one. They are small, from 3 feet 4 inches to 3 feet 8 inches in length, and 3 feet to 3 feet 8 inches in height. The animals of the pure breed are light yellow; face and skull white; the shape is fine; the head broad, the same as to the snout; the horns are thin and not long; the back is short and straight; the flanks are strongly built; the shanks are muscular, but meager; the legs are vigorous, but often crooked; their gait is light and swift. As to character, these animals are very good-natured and tame. The bulls are very docile. Although the cows do not require much food, they produce about 450 gallons of milk in 300 days of the year. The meat of the Black Forest cattle is not as good as that of the other varieties of Baden. In summer the oxen and cows are driven to the mountain pastures; in winter they get hardly anything but chopped straw and hay to eat.

The fact that this breed has remained pure during several centuries is explained by the fact that the farmers in the mountains do not have money enough to introduce foreign bulls. In the districts north from the Black Forest the fodder plants are more abundant, and the breed of cattle there, although bearing a great resemblance to the above-described breed, are much larger and more fleshy. The cattle of this district have been cross bred with Simmenthal and Baar cattle. The principal occupation of the farmers of this section is to raise young animals until they are two or three years old, and to sell them afterwards to the adjacent countries, such as Alsace, Wurtemberg, &c.

ODENWALD CATTLE.

In the Odenwald there is a breed which are adapted to the poorness of the soil (colored sandstone). These animals measure on an average 3 feet 10 inches in height and 4 feet 6 inches in length. The hair is generally brown; the head narrow and short; the back is a little bent; the legs are weak and the shanks thin. The milk production is not large, nor are these animals fit for fattening. Cows sell for $35, oxen for $30, and bulls for $42.

THE NECKAR CATTLE.

In the northern hilly part of Baden, embracing the districts of Bretten, Bruchsal, Heidelberg, and Werthein, exists a variety which is generally called the Neckar cattle. These cattle meet the requirements of the small farmers, as they reach maturity very fast. The average height is 5 feet 6 inches for oxen and 5 feet for cows. The average length for oxen is 5 feet, and for cows, 4 feet 10 inches. The color is mostly brown or brownish red; the head small, the neck short; back straight and fleshy; legs very short and muscular. The breed is less fit for dairy than for fattening.

Weight.

Description.	Meat weight.	Live weight.
	Pounds.	*Pounds.*
Ox of four years	600	1,020
Cow of three years	420	750
Calf of fourteen days	60	100

Bulls cost $60 to $75; cows, $50 to $60; calves, $7 to $9.

CATTLE CENSUS OF BADEN.

The Badish Government has done very much for the improvement of the live stock of Baden, especially by importations of Swiss spotted cattle (Simmenthaler), and by a law establishing the quality and number of bulls to be kept in every community. The last cattle census, made in 1880, states the total number of horned cattle in Baden to be 630,480 head; bulls, 8,397; cows, 474,555; oxen, 112,559; calves, 34,969. This gives an average number of 58 cattle to a square mile.

For the inclosed photographs of the Messkirch breed of cattle, I am indebted to the courtesy of his excellency the states minister of the Grand

Duchy of Baden, who, upon hearing that I was engaged in the preparation of a report on the Badish cattle, instructed the proper persons to have these photographs taken and sent to me free of charge.

FRANK M. BALLOW,
Consul.

UNITED STATES CONSULATE,
Kehl, Baden, October 14, 1884.

Special statistics of Badisk cattle.

Name of breed and district.	Average milk in 300 days.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Size at maturity.			Live weight.		
				Average of 50 cows.	Average of 10 bulls.	Average of 20 oxen.	Average of 21 cows.	Bulls.	Average of 20 oxen.
	Gallons.	*Gallons.*	*Gallons.*	*Ft.*	*Ft.*	*Ft.*	*Lbs.*	*Lbs.*	*Lbs.*
Messkirch cattle; district of Messkirch, Baden	475 to 500	3½	1½ to 1¾	4 1/12	4 1/12	4½	1,200	1,800 to 2,400	1,194
Baar cattle; greater part of the district of Donaueschingen, Baden	500	3½ to 3¾	1	4	4½	4 1/12	1,100	1,600	1,300

MESSKIRCH CATTLE.

Maturity: Age, 1½ to 1¾ years, frequently 1 year; weight, 660 to 900 pounds; 430 to 600 pounds of meat, 52 to 55 per cent. of weight.

Color: Yellow, with white spots, sometimes red-yellow; nostrils colorless; horns and hoofs yellow.

Description: Fine shape, proportionately high and long; back straight; shanks and flanks vaulted; legs of middle length, muscular; the croup is about 2 inches higher than the withers.

Breeding: The breeding commenced forty-five years ago. The original cattle were the Swabian Alp, cattle of small size, one-colored, either red or yellow. It was very frugal and productive in milk.

Product: This breed is excellent for labor on account of their strength and endurance. They are much sold for fattening; the meat is healthy, succulent, and of excellent taste; milk very good, resembling Swiss milk, containing more caseine than any other breed.

BAAR CATTLE.

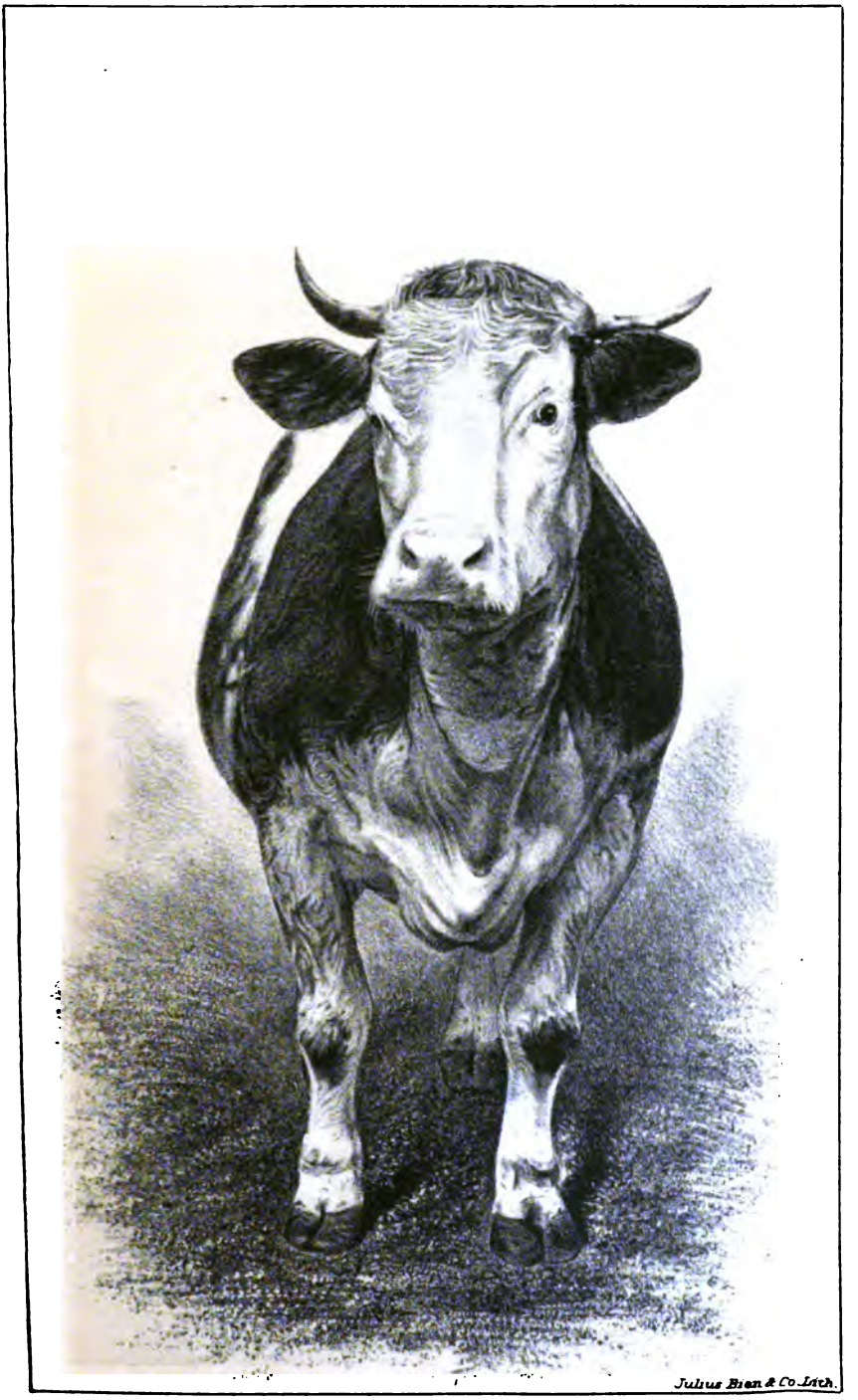
Maturity: Age, 4 years generally; weight, 500 to 1,000 pounds.

Color: Mostly white, with red, yellow, or brown spots on the flanks; head and feet white.

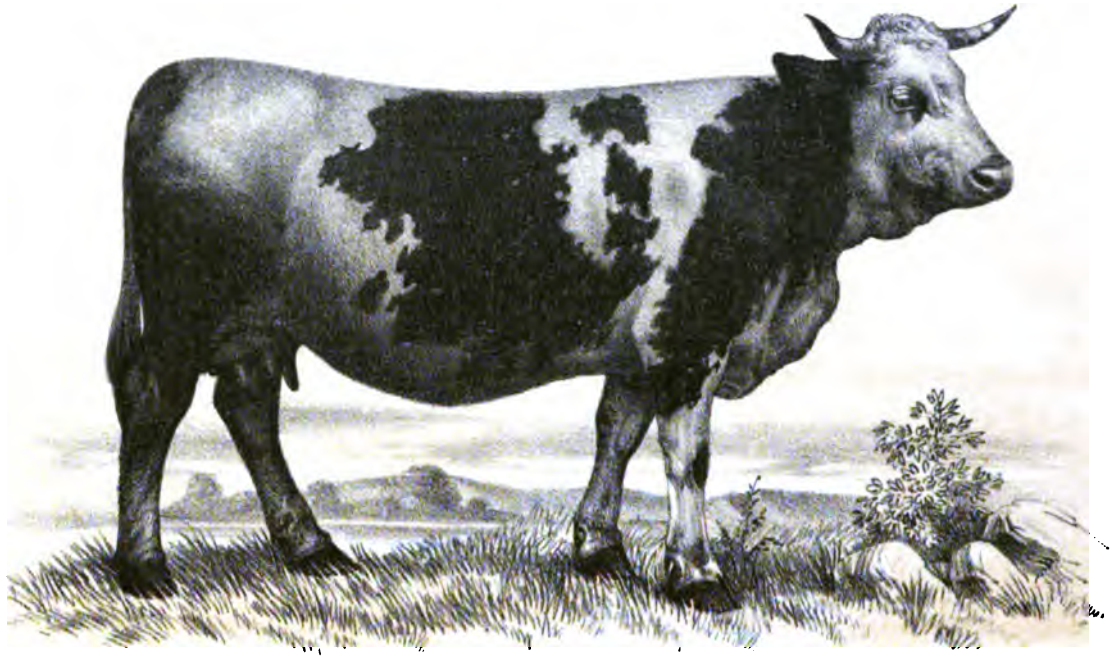
Description: Short, pointed head, fleshy shoulders, very straight back, and thin, short legs.

Breeding: This breed was never pure; it is a cross-breed of original South Baden cattle and Swiss bulls. Swiss bulls from Canton Bern were first introduced into this district about one hundred years ago.

Product: Very good for labor. The meat is of medium quality, milk of middle quality, and cheese good.



COW MESSKIRCH BREED (BADEN)



Julius Braun & Co. Lith.

COW MESSKIRCH BREED (BADEN)

Julius Bien & Co. Lith

COW. MESSKIRCH BREED (BADEN)

Julius Bien & Co. Lith.

BULL, MESSKIRCH BREED (BADEN)

Julius Bien & Co. Lith.

BULL, MESSKIRCH BREED (BADEN)

YEARLING, MESSKIRCH BREED (BADEN)

CATTLE AND CATTLE PRODUCTS IN BADEN.

REPORT BY CONSUL SMITH, OF MANNHEIM.

I have the honor to report in reply to circular letter issued from the Department of State July 18, 1883, that the breeding of domestic animals in the Grand Duchy of Baden is conducted, in a very limited and primitive manner, by peasant farmers who occupy small farms. No large grazing herds are seen.

Baden possesses, peculiar to itself, four breeds of cattle, viz, Hinterwalder, Messkircher, Odenwalder, and Neckar.

An important result can only be realized in Baden when cattle can be fed on soil which has a substratum of lime. A substratum of granite and sand is not favorable to the growth of foreign cattle. Even where lime exists, refreshing of the blood is required by continued importation of fresh animals, especially male breeders. Breeds original to marshy countries have been transferred to the plains of the Rhine, where the soil is sandy, without success in retaining their original characteristics. The best cattle for transportation in Baden is a breed called Messkircher, produced by a cross with a Swiss breed called Simmenthaler. Breeders of cattle have ascertained to a certainty that the breed called Simmenthaler in South Germany is the best for crossing with other breeds, especially these brought up on a lime soil.

The colors are as follows:

Hinterwalder.—Dappled white and yellow.

Messkircher.—Dappled white and yellow and dappled white and red.

Odenwalder.—Grayish brown.

Neckar.—Dappled white and yellow.

The total number of cattle in Baden is 650,000.

The percentage of the different breeds is Hinterwalder and Messkirchêr about 60 per cent., Odenwalder and Neckar about 40 per cent.

The annual production of milk is about 480,000,000 liters.

The increase or decrease of cattle stock depends upon the crop and prices of hay, turnips, &c., such increase or decrease varying from 5,000 to 40,000 heads.

In 1876, when the crop of grass was very small, the total number of cattle in Baden was only 568,000; yet in 1879, when the crop of grass was plentiful, the total was 665,000.

The stock seems to be sufficient for demand. From the average stock of 650,000 head about 200,000 head are killed each year, enough for the general requirements of the people. There is not much meat eaten by the common people. Meat once a week is the usual customary diet.

There is no excess in the demand for foreign cattle. If cattle are imported they come from the adjoining countries of Wurtemberg and Bavaria. The insufficiency for a home demand is not noticeable.

On occasions when the crop of grass has been very poor in Upper Silesia and upon the marshy grounds of Holland, cattle have been sent from there to Baden and sold at low prices.

Cattle supplies are not drawn to Baden from the United States. The cattle of Baden are mostly, with a few exceptions in the Schwarzwald, stall-fed from their birth, making a different meat from that of the grazing animals of America. The meat of German stall-fed animals is hard and marbled with fat and lean.

Unless stall-fed cattle were sent to Baden the meat would be objected to by Badeners, who prefer lean stall-fed meat. Consequently the exportation of American cattle to Baden has not taken place.

For the transportation of cattle the best and usual method in Germany is by rail. Cattle are fed and watered in the rail wagons and on arrival at destination. The wagons are disinfected and fumigated with great care.

Sheep when transported long distances are taken from the wagons and allowed to graze several times upon their journey. The sheep, accompanied by a shepherd and his dog, are rapidly conducted to some neighboring field where good grazing can be found. When the whistle of the engine notifies the shepherd, he notifies the dog, who with astonishing rapidity collects the sheep, and with the obedience and precision of drilled soldiers they return to the wagons and proceed upon their journey.

The estimated expense for attendance and food *en route* is about $5 per head from Mannheim to the seaport; the time employed about four days.

EDWARD M. SMITH,
Consul.

UNITED STATES CONSULATE,
Mannheim, January 25, 1884

Statistical table regarding the cattle of Baden.

Name of breed.	County or district.	Annual average production of milk per cow.	Size at maturity.			Age at maturity.	Live weight.		
			Cow.	Bull.	Ox.		Cow.	Bull.	Ox.
		Kilos.	*Meters.*	*Meters.*	*Meters.*	*Years.*	*Kilos.*	*Kilos.*	*Kilos.*
Hinterwalder (Black Forest).	Black Forest..	1,000 to 1,800	1·05	1.10	1.18	5	300	450	500
Messkircher.....	Boden-See	1,200 to 3,000	1.40	1.50	1.60	4	500	800	900
Odenwalder.....	Odenwald.....	800 to 1,000	1.10	1.20	1.30	5	300	400	450
Neckar.....	Neckar	1,200 to 3,000	1.36	1.50	1.60	4	400	800	900

County or district.	Topography.				Soil.	Substratum.
	Altitude above sea-level.	Mean temperature.	Summer.	Winter.		
	Meters.	°*C.*	°*C.*	°*C.*		
Black Forest....	700 to 1,000	8	16 to 18	2 to 5	Loam.....	Granite, gravel.
Boden-See.....	500	8	16 to 18	2 to 5	Alluvial, loam, and clay.	Limestone.
Odenwald.....	300	8	16 to 18	2 to 5	Loam, sandy.....	Sandstone.
Neckar.....	300	8	18 to 20	4 to 6	....do	Limestone, gravel.

REMARKS.

Hinterwalder.—This is a home-bred race, of a dappled white and yellow color; they are useful as work cattle, for their meat, and for milking. The yield of milk is large and of good quality; 24 pounds of milk produce 1 pound of butter; 10 pounds of milk 1 pound of cheese. In summer they are put out to graze, and in winter stall-fed.

Messkircher.—This is a home-bred race crossed with Simmenthal; they have been bred pure for about fifty years, the original coming from Switzerland. The color is white and yellow and white and red. As milkers and butter producers they rank with the Hinterwalder, and are used for the same purposes. Stall-fed.

Odenwalder.—This race is home-bred, of a grayish-brown color; they are used as work cattle and are good milkers; 24 pounds of milk yield 1 pound of butter; very little cheese manufactured. Stall-fed.

Neckar.—A home-bred race crossed with Simmenthal, the original coming from Switzerland; they have been bred pure for about fifty years. In color they are dappled white and yellow. As milkers and butter producers they rank with the Odenwalder, and are used for the same purposes. Stall-fed.

The weight of meat at maturity in all of the above is one-half of the live weight.

The manufacture of cheese is insignificant; only some common cream and hand cheese is made.

The ordinary method of housing is pursued; hay after-grass, roots, turnips, carrots, potatoes. Timothy, clover, rye, grass, &c., grow everywhere. Breeding is at a low point, and does not furnish a good example for other countries. Products are mostly used for home consumption.

BAVARIAN CATTLE.

REPORT BY CONSUL HARPER, OF MUNICH.

The neat cattle of Bavaria are good for the combined purposes of draft, beef, milk, butter, and cheese, but no variety among them equals the Shorthorn, the Jersey, or the Holstein in its specialty.

The use of the ox extensively and of the cow occasionally for draft has probably been the main obstacle to the differentiation of superior dairy qualities in Bavaria, as well as in some other countries of continental Europe. The breeds that would take the highest prizes and command the highest prices for the production of butter, cheese, and beef must not be praised as the Bavarian cattle are for speed and strength in harness. The yoke, if not unknown here, is at least a great rarity. The ox pulls by traces, attached to a stick about 16 to 18 inches long, lying across his forehead and tied to his horns; and he works either singly or in double team, as occasion requires.

It is only within a generation or two that the breeding of neat cattle for dairy specialties has been commenced in Bavaria, and if any variety has had time to acquire a definite character with surpassing excellence, the fact has not yet been made known by general reputation.

Bavaria has no dairy product celebrated for quality or quantity. It has no world-famous brand of butter or cheese. It exports beef cattle, but not in large numbers. It will probably never import much beef or dairy produce from any source; nor do I see any reason to anticipate that there will ever be any very great increase or decrease of the stock of neat cattle. The dairy breed will doubtless continue to improve for many years to come.

Since, in my opinion, there are no neat cattle here that can be exported to the United States with profit, I have not thought it desirable to study the methods, routes, and costs of exportation.

JOSEPH W. HARPER,
Consul.

UNITED STATES CONSULATE,
Munich, January 14, 1884.

TOPOGRAPHY AND TEMPERATURE OF BAVARIA.

It is impossible to give the exact average temperature of entire districts, but only to name a place which represents the temperature of the climate in each district.

As the difference of the temperatures in the whole Kingdom of Bavaria is not very great, the average variation of temperature may be stated as inside 0.5°, as appears from the following table.

The heights and temperatures refer to each selected place in the named district.

District.	Representative place.	Altitude.	Temperature (centigrade), 1879–1882.		
			July.	January.	Year.
Upper Bavaria:		*Feet.*			
Near mountains	Munich	1,689	16.99	−3.96	7.64
Mountains	Traunstein	1,949	17.16	−4.27	7.07
Lower Bavaria:					
Near Kelheim	Regensburg	1,105	17.28	−3.94	8.37
Palatinate:					
North	Grunstadt	541	18.88	−2.77	9.04
South	Landau	470	18.89	−1.64	9.41
North Upper Palatinate	Weiden	1,290	16.85	−4.47	7.02
Upper Franconia:					
Main valley	Bamberg	784	17.41	−2.90	7.76
Fichtel Mountains	Bayreuth	1,119	16.53	−4.73	7.09
Middle Franconia	Ansbach	1,326	16.60	−4.52	7.33
Lower Franconia, main valley	Wurzburg	593	18.39	−4.11	8.68
Swabia	Kempten	696	16.50	−5.09	6.65

The above figures are calculated by the Royal Bavarian meteorological central station.

SOIL OF BAVARIA.

Alluvial: Alluvial soil exists in the valleys of all larger rivers of the country, principally those of the Danube and its tributaries and of the Rhine and Main. The alluvial formations of the Danube consist principally of coarse and lime sand and marly deposits. The same character pervades the alluvial of the tributaries of the Danube coming from the south, viz, Iller, Lech, Isar, and Inn. In those tributaries rising in the north, viz, the Naab, Regen, and Ilz, as alluvials, quartz, mountain pebbles, and sand loam predominate; but in the valleys of Laber, Altmuhl, and Wornitz limy alluvials abound.

The alluvials of the Rhine consist chiefly of quartz, pebbles, clay, and sand. In the Main Valley we find mountain gravel and sand only here and there. Near Wurzburg limy pebbles are found.

Loam: Supposing loam ground to be the opposite of limy or marly clay ground, the following are the principal localities where it is found: (1) A great part of the Bavarian Alps, in Upper Bavaria and Swabia. (2) In the Bavarian plateau south of the Danube, of Swabia, Upper Bavaria, and Lower Bavaria. (3) In the territory of Franconia-Jura, from Ulm over Nordlingen, Eichstadt, and Regensburg, northward to Bayreuth and Lichtenfels, in the districts of Swabia and Upper Palatinate, Middle Franconia and Upper Franconia. (4) In the shell-lime plateaus between Rothenburg, Wurzburg to Kissengen and Melrichstadt, in the districts of Middle and Lower Franconia. (5) On the shell-lime plateau of the Palatinate, from Homburg, Bliesskastel, Pirmasens, over Zweibrucken, Sickinger-High, to Landstuhl, and in the plain of the Rhine.

Clay: Under the supposition concerning loam ground above mentioned, clay abounds, mixed with sand, in the following districts: (1) In the mountain districts of the Bavarian and Upper Palatinate forests, districts of Lower Bavaria and Upper Palatinate. (2) In the Fichtel Mountains and in the district of Upper Franconia. (3) In some places in the Keuper territory, in the district of Middle Franconia, and finally in the coal territory of the western part of the Palatinate.

Sand: Sand soil predominates here and there, mixed with loam, in the Molasse territory of the Alps of Upper Bavaria and Swabia. Clay sand exists in the mountain districts of East Bavaria, Upper Palatinate, and Lower Bavaria, and in the granite mountains of Fichtel, in Upper Franconia, and in the Keuper territory of Middle Franconia, Upper Franconia, and a part of Upper Palatinate; also in the territory of the colored sandstone in Lower Franconia (Spesshardt) and at the end of the Haardt Mountains of the Palatinate.

SUBSTRATUM.

Limestone: Limestone is the substratum of the soil in the following sections of the country: (1) In the Alps, Upper Bavaria, and Suabia. (2) In Franconia, Jura, mouth of the Danube (a small spot excepted between Abensberg and Regensburg), in the districts of Swabia, Upper Palatinate, Middle and Lower Franconia. (3) In the shell-lime territory of Middle, Lower and Upper Franconia. (4) In the shell-lime

district of Southwest Palatinate, and on a small strip on the east line of the Haardt Mountains.

Sandstone: Sandstone formations exist in the substratum of the following sections of the country: (1) Marly sandstones alternate in the south Bavarian plateau of the districts of Upper Bavaria, Lower Bavaria, and Swabia. (2) In the Keuper Mountains of Middle, Lower, and Upper Franconia; also in parts of the Palatinate. (3) Clay slate alternates in the northwest parts of the Fichtel Mountains and in the Franconia forests. (4) In the Spesshardt and adjoining sections of Lower Franconia. (5) Mixed with basalt, in the Rhone Mountains of Lower Franconia. (6) In the Haardt Mountains of the Palatinate. (7) In the coal districts of the western Palatinate.

Granite: Granite and mountain rock (gneiss unicalate) compose the substratum in the following districts: (1) In the Bavarian and Neuburger forests and Lower Bavaria. (2) In the forests of Upper Palatinate, along the line of Bohemia. (3) In the middle of the Fichtel Mountains, and in the Munchberg gneiss circle, district of Upper Franconia. (4) In the Lower Spesshardt, near Lower Franconia and Aschaffenburg.

Clay: Clay-stone (clay-slate, coal-slate, potter-slate) is found: (1) In the northern part of Upper Palatinate (environ of Waldsassen). (2) In the clay-slate district of the Fichtel Mountains and Franconia forests (Upper Franconia). (3) Mixed with sandstone in the Keuper districts of Upper, Middle, and Lower Franconia, here and there in the Upper Palatinate. (4) In the coal mountains of the western Palatinate. (5) In the northern part of the Bavarian plateau, particularly near Straubing, Pfaffenhofen, in the main district of Lower Franconia, and in the plain of the Rhine Valley.

Gravel: Gravel in a conglomerated form is found in the territories mentioned as of alluvial soil, principally at the base of the Alps extending through the districts of Upper and Lower Bavaria and Swabia.

CULTIVATED GRASSES.

Timothy: Timothy (*Phleum pratense*) is cultivated in preference, but not often, in those districts where there are no meadows, mixed with clover and other grasses for the development of new meadows. According to the cultural statistics of the year 1878 in Bavaria 10.1 per cent. of the total average is cultivated as grazing land for cattle.

Clover: Red clover (*Trifolium pratense*) is cultivated most, and monopolizes the largest acreage of land. It is used green or as dried clover hay. For green fodder in Franconia, the Steyermarker green clover is preferred. Red clover prospers in nearly all kinds of soil where the vegetation of this specialty, because of too frequent cultivation, has become uncertain; there the Swedish clover (*Trifolium hybridum*) is cultivated with success. White clover is chiefly cultivated for specially-made sheep pastures. Lucern clover (*Medicogo cativa*) is most in favor on the Jura plateau. Esparsette clover (*Onobrichicsativa*), Turkish clover, is cultivated chiefly in the shell-lime districts. French clover (*Trifolium incarnatum*) is uncertain; it prospers the best in the wine regions and is mostly cultivated as a substitute in case of failure of seed clover.

Rye grass, &c.: Italian rye grass mixed with red clover instead of clover is cultivated seldom as hill-side seed; also mixed with other kinds of grass and clover for cultivating new lands. The English rye is but seldom cultivated. The French rye (*Avena elatior*) is used as a top grass for cultivating fodder grass mixed with different kinds of clover.

HOUSING, FEEDING, AND BREEDING CATTLE IN BAVARIA.

Methods of housing: The stables are, with few exceptions, good ones, and solidly built. The recently built ones are mostly with iron arches, stone pavement, and open drains. In the mountain regions the stables are still of wood, low, and badly ventilated.

Feeding: In the mountains a greater part of the cattle feed in the Alpine pastures between May and October. On the plains they are generally fed in the stables and only put out to fall pasture after the meadows are mowed.

The pasture in the Alps, where no overcrowding takes place, where pastures are manured and changed, is excellent, particularly in Allgau. In the mountains of Upper Bavaria the Alpine economy is still not as good as it should be.

In general the feeding of cattle has become better in consequence of more extended fodder cultivation. The vegetable cultivation has increased considerably and the use of vegetable waste and strong fodder is important.

In places where the cultivation of grain is carried on to a disproportionate extent or where horse-raising prevails, the neat cattle still suffer for the want of food, as in Ingolstadt, Straubing, and in the whole Rotthal Valley.

Breeding: Where the breeders possess sufficient knowledge, and understand the superiority and value of native pure-bred stock, their avocation is lucrative. Numerous unions have been formed for the encouragement of improvements in breeding stock. Some years ago a preference existed in favor of the Simmenthal cattle from Switzerland, which were frequently crossed with other breeds. Now this method is disappearing, and the conviction prevails that when well cared for and well bred the Bavarian cattle are equal in every way to the Swiss.

HANDLING CATTLE PRODUCTS IN BAVARIA.

The most of the Bavarian breeds furnish excellent cattle for working and fattening, and the Bavarian beef is well and favorably known at home and abroad and commands a good price. The oxen are the principal source of income of cattle-breeders, and they are bred with excellent judgment. Being trained to work they are much sought after in the many cattle markets by dealers from other countries, especially from North Germany, where, after they are three or four years old, they are worked and then fattened.

The Bavarian oxen are easy going, fast steppers, represented to be better than horses in pace, and are very enduring, tough, good and frugal eaters, fatten quickly, attain heavy weights, and furnish a tender and palatable meat.

The dairy business is carried on largely only in the south of Bavaria, but, since the last five years, has been extending. The Allgau cheese now compares favorably with Emmenthal, but, as yet, in quality, is not quite its equal.

Bavarian table butter from the centrifugal dairies goes in large quantities, mostly in an unsalted state, to North Germany and, slightly salted, to England. With the increase of dairies, breeding and fattening of hogs has also increased, both in quantity and quality in Bavaria.

* *Special statistics of Bavarian cattle.*

Name of breed.	Annual average of milk.	Milk to pounds of butter.	Name of district.	Height from ground to withers.			Length of body.			Girth behind the shoulders.		
				Cow.	Bull.	Ox.	Cow.	Bull.	Ox.	Cow.	Bull.	Ox.
	Lbs.	*Quarts.*		*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*
Pinzgauer*	5,500	10.5 to 12.3	Upper Bavaria	53.1	52.2	....	62.9	61.0	....	78.7	81.8	....
Miesbacher*	5,060	10.5 11.4	.....do	55.1	55.1	64.9	61.0	61.0	66.9	70.0	78.7	94.4
Simmenthaler*	5,500	10.5 11.4	Dispersed through nearly all Bavaria.	56.6	55.1	64.5	61.0	61.0	73.8	70.0	78.7	91.3
Ansbacher*	5,500	10.5 11.4	Middle Franconia	52.3	52.7	....	61.4	62.9	....	76.7	77.9	....
Kelheimer*	3,300	9.6 11.4	In Middle Franconia and Lower Bavaria, and especially in Upper Palatinate.	52.3	54.3	60.5	62.9	62.9	62.9	76.7	81.8	78.7
Allgauer*	6,600	9.6 11.4	In Suabia, Neuburg, Upper Bavaria, and partly in the remaining districts.	51.2	55.1	....	....	61.0	....	71.9	77.1	....
Glan Donnersberger†	4,400	10.5 12.3	Palatinate	51.2	53.5	....	61.0	64.9	....	71.3	....	....
Scheinfelder†	4,400	10.5 11.4	In the three Franconia districts and in the Upper Palatinate.	55.1	55.1	61.4	62.9	61.4	66.9	77.5	77.1	84.6
Illinger†	5,500	10.5 12.3	Middle Franconia	53.1	53.9	....	61.0	62.9	....	78.7	80.3	....
Voigtlander†	3,300	10.5 11.4	Upper Franconia and Upper Palatinate.	49.8	51.2	60.5	57.4	62.9	66.9	72.8	73.8	83.6
Murnau-Werdenfelser†	4,950	10.5 11.4	Upper Bavaria	50.0	53.5	63.7	61.0	57.0	62.9	70.9	....	....
Bayreuther Schecken†	4,400	10.5 11.4	Upper Franconia	....	....	....	....	....	....	....	....	....

* To make 1.1 pounds of fresh cheese it takes from 23 to 26.4 pounds of rich milk; 28.2 to 29 pounds of half-skimmed milk; 33 to 37.4 pounds of skimmed milk.

† For 1.1 pounds of Limburger cheese it takes 7.9 quarts of sour milk; 4.4 to 5.2 quarts of good milk: 5.2 to 6.1 quarts of half-skimmed milk.

Special statistics of Bavarian cattle—Continued.

Name of breed.	Live weight.			Per cent. of meat at maturity to live weight.*	Color.	Description of.
	Cow.	Bull.	Ox.			
	Cwt.	*Cwt.*	*Cwt.*			
Pinzgauer	11. 8–15. 7	12. 7–15. 7	14. 7–19. 6	52–56	Red, brown, and white on the back.	Well-formed animals, with deep body and good developed flesh.
Miesbacher	9. 8–13. 7	15. 7–17. 7	13. 7–17. 7	47–49	Yellow and spotted.	Middle to large, rather fleshy; large-boned.
Simmenthaler	11. 8–17. 7	17. 7–19. 6	15. 7–17. 7–19. 6	47–49	....do	Very large and heavy; fleshy; long legs and large-boned.
Ansbacher	11. 8–13. 7	11. 8–17. 7	15. 7–17. 7	50–52	....do	Large and heavy, some with long legs; found chiefly in the low grounds.
Kelheimer	8. 8–10. 8	9. 8–11. 8	12. 7–15. 7	50–55	Red-brown, with spot on the head.	Light to medium weight; well-proportioned; very frugal and tough.
Allgauer	7. 8– 9. 8	8. 8–12. 7	9. 8–15. 7	50–55	Plain gray	Light to medium weight; well-proportioned, with good milk marks.
Glan Donnersberger	7. 8–13. 7	10. 8–14. 7	14. 7–17. 7	50–55	Plain yellow, with light marks.	Medium weight, with fair forms; fine; good milk marks.
Scheinfelder	8. 8–10. 8	11. 8–15. 7	12. 7–16. 7–19. 6	50–55	....do	Medium weight, with fair forms; fine; good milk marks; excellent for work and fattening; particularly used in North Germany, and in much demand.
Ellinger	8. 8–11. 8	11. 8–16. 7	12. 7–16. 7–19. 6	50–55	Plain yellow, with dark marks.	Do.
Voigtlander	7. 8– 9. 8	7. 8–11. 8	13. 7–15. 7	52–60	Plain light brown, with light mouth.	Medium weight, with excellent body; very straight and deep; in much demand.
Murnau-Werdenfelser	6. 8– 9. 8	8. 8–12. 7	9. 8–15. 7	52–56	Plain yellow-brown, with dark marks.	Rather large; well formed; delicate.
Bayreuther Schecken	8. 8–12. 7	11. 8–15. 7	11. 8–17. 7	47–49	Yellow and red, spotted.	Large to heavy; rather fleshy; large-boned.

*Of this weight it is understood that the meat in the four quarters, with tallow and kidney grease, are included.

Of all the races the Miesbacher and Simmenthaler are the most mature at two to three years of age. The Kelheimer, Scheinfelder, and Voigtlander mature only at five years of age.

At the end of the first year all these animals reach half of their weight at maturity.

Name of breed.	How long bred pure.	Origin of breed.	Working quality.	Product.	
				Meat.	Milk.
Pinzgauer	A century	Bavarian race	Excellent	First rate.	Fair and very good quantity.
Miesbacher	80 years	Pinzgau and Simmenthal cross.	Fair	Much, but not fine.	Fair to good.
Simmenthaler	do	Swiss	do	do	Do.
Ansbacher	125 years	Ostfries and Bern	Excellent	Fair	First rate.
Kolheimer	A century	Bavarian race	do	do	Fair.
Allgauer	do	Swiss (gray and brown)	do	Little and indifferent.	First rate.
Glau Donnersberger.	do	Bavarian race	do	Fair	Good.
Scheinfelder	do	do	do	do	Fair.
Illinger	60 years	Red Bavarian and Allgau mixed.	do	do	Very good.
Voigtlander	A century	Tyrol	do	do	Fair.
Murnau-Werdenfelser.	20 years	Gray Swiss, Wurzthal, and Montefumer mixed.	do	do	Good.
Beyreuther Schecken.	Still in formation.	Bavarian, mixed with Bern and Miesbach.	Fair	Much, but not fine.	Fair.

Cheese.—The dairy is developed mostly in Suabia and Neuburg, next in Allgau, where they make round cheeses like the Swiss in form, and in Upper Bavaria. In the last-mentioned places the milk is worked into butter and Limburger cheese. In the remaining part of Bavaria the dairy is not much developed, as they keep the cattle for purposes of breeding and fattening.

CATTLE IN THE DUCHY OF BRUNSWICK.

REPORT BY CONSUL FOX.

In compliance with Department circular of July 18, received October 3, 1883, I have the honor to transmit herewith a report on the various breeds of cattle maintained in the Duchy of Brunswick. I hope to be able to make a supplementary report in regard to the subject at an early day.*

There are at present four representative breeds of cattle in the Duchy of Brunswick, viz, Holland, Oldenburg, Harz, and the common kind, so-called "Landviehrasse"; the two latter have their origin in the duchy. The Harz cattle, which were introduced some fifty years since, taking their name from the Harz Mountains, where they were first reared, and the common breed, which have existed from time immemorial, are crossed with the imported Holland and Oldenburg animals, the offspring resembling the latter to a great extent. The importation of the offspring into the United States could hardly be recommended, as the original breeds would most naturally have the preference. The Harz animal, on the other hand, has proven to be a most suitable one for the raw climate of the Harz Mountains, and attempts to cross them with other breeds in order to obtain better individual qualities have always resulted in failure, so that now the greatest care is observed to breed them as pure as possible. Wherever an intense system of agriculture is maintained, especially in those parts of the duchy devoted to the culture of the sugar-beet, and where food is plenty, the Holland and Oldenburg breeds are to be found, they having been either imported directly, bred from imported animals, or are the result of crossing. The

* "Harz cattle for export to the United States" immediately follows this report.

keeping of these animals is dependent more upon economical than upon natural circumstances, and as my colleagues in the various districts will have given more perfect information in regard to them than I possibly can glean here, I have omitted them in filling out the forms sent by the Department. With good housing and feeding the Holland and Oldenburg cattle prosper as well here, and the yield both for dairy and butcher is as abundant, as in the lands of their nativity. I beg to inclose tables showing the number of cattle in Brunswick, as well as other statistics in regard to them taken from the official report of the Ducal Brunswick Bureau of Statistics for the year 1883. The percentage of the several breeds, as well as the percentage bred for dairy and for butcher is not to be obtained, since the animals are rarely reared for the butcher exclusively, but the cows and oxen are used first for several years for dairy and labor, respectively, before they are fattened for consumption. The stock is not sufficient to supply the demand; numbers of steers and pregnant heifers are annually imported from Holland and Oldenburg. For the beet-sugar industry a large number of Bavarian draft oxen are imported and a smaller number of Breitenberger and Glauer. Shorthorns are also imported and crossed to some extent, in order to increase the meat product. Swiss cattle are to be found only in small numbers. There is no export worth mentioning except to the neighboring Prussian province of Hanover and of fattened animals to the larger cities. In Hanover the Brunswick cattle are crossed with the local cattle in order to obtain draft animals.

WILLIAMS C. FOX,
Consul.

UNITED STATES CONSULATE,
Brunswick, December 4, 1883.

BRUNSWICK CATTLE STATISTICS.

Comparative statement showing the number of cattle in the Duchy of Brunswick in the years 1873–'83, *with increase and decrease, respectively.*

[From official census taken January 10, 1883.]

Districts.	Whole number counted.		Increase or decrease since 1873.		Average to 1 square kilometer.			Average to 1,000 inhabitants.		
	1873.	1883.	+Increase; −decrease absolutely.	Per cent.	1873.	1883.	Per cent.	1873.	1883.	Per cent.
I	3,325	3,244	− 81	−2.43	10.90	10.63	−0.27	245.95	226.40	−19.55
II	3,221	3,116	− 105	−3.26	10.73	10.36	−0.37	185.70	148.53	−37.17
III	21,675	22,878	+1,203	+5.55	19.43	20.51	+1.08	261.64	261.50	− 0.14
IV	42,809	46,493	+3,684	+8.61	29.04	31.60	+2.65	401.09	404.09	+ 3.00
V	12,569	12,409	− 160	−1.27	28.89	28.49	+0.40	599.58	565.79	+33.79
VI	2,573	2,647	+ 74	+2.88	45.94	46.85	+0.91	611.01	626.81	+15.80
Total in duchy.	86,172	90,787	+4,615	+5.35	23.32	24.63	+1.31	350.41	343.43	− 6.98

PRICES AND WEIGHT OF BRUNSWICK CATTLE.

TABLE B.—*Statement showing selling price and live weight of cattle in the Duchy of Brunswick.*

[From official census taken January 10, 1883.]

TOTAL SELLING PRICE.

Districts.	Calves not 6 weeks.	Calves from 6 weeks to 6 months.	Animals from 6 months to 2 years.	2 years and over.		
				Bulls (breeders.)	Steers and oxen.	Cows.
	Marks.	*Marks.*	*Marks.*	*Marks.*	*Marks.*	*Marks.*
I	4,690	18,340	89,886	7,685	11,250	485,300
II	3,744	8,768	64,665	10,200	81,375	582,930
III	25,760	114,855	699,440	44,800	289,080	3,443,280
IV	58,730	374,940	1,809,400	206,400	1,711,660	8,157,200
V	19,410	84,770	390,600	20,000	77,100	2,130,800
VI	3,350	18,240	118,350	2,000	400	544,950
Total in duchy.	115,674	619,933	3,172,341	291,085	2,170,865	15,325,160

Description: Age at maturity, two and a half years; weight of meat at maturity, 350 to 400 pounds, unfattened; single colors, light reddish, brown, chestnut-brown to brown-black. Head comparatively broad and short. Horns not particularly fine; are turned back. Rump and tail epiphysis slightly high. Udder small. Legs short and fine-boned, small and very compact hoofs. They have been bred pure since 1830. The origin of breed was a cross of the local animals with those of Tyrol, and are splended draft animals. The meat is of middling quality; milk fat and cheese good.

Topography: Altitude, 300 to 500 meter; mean temperature, 4.85° to 5° C.; summer, 11.56° to 12°; winter, 1.51° to 0.5°. Soil transition from loam and clay to sand.

Substratum: Ancient crystalline stone, graywacke, slate, and chalk, with mixture of diorite and porphyry.

Cultivated grasses: Red clover, *Trifolium pratense*, often mixed with timothy (*Phleum*), of late with *Arthyllis vulneraria*.

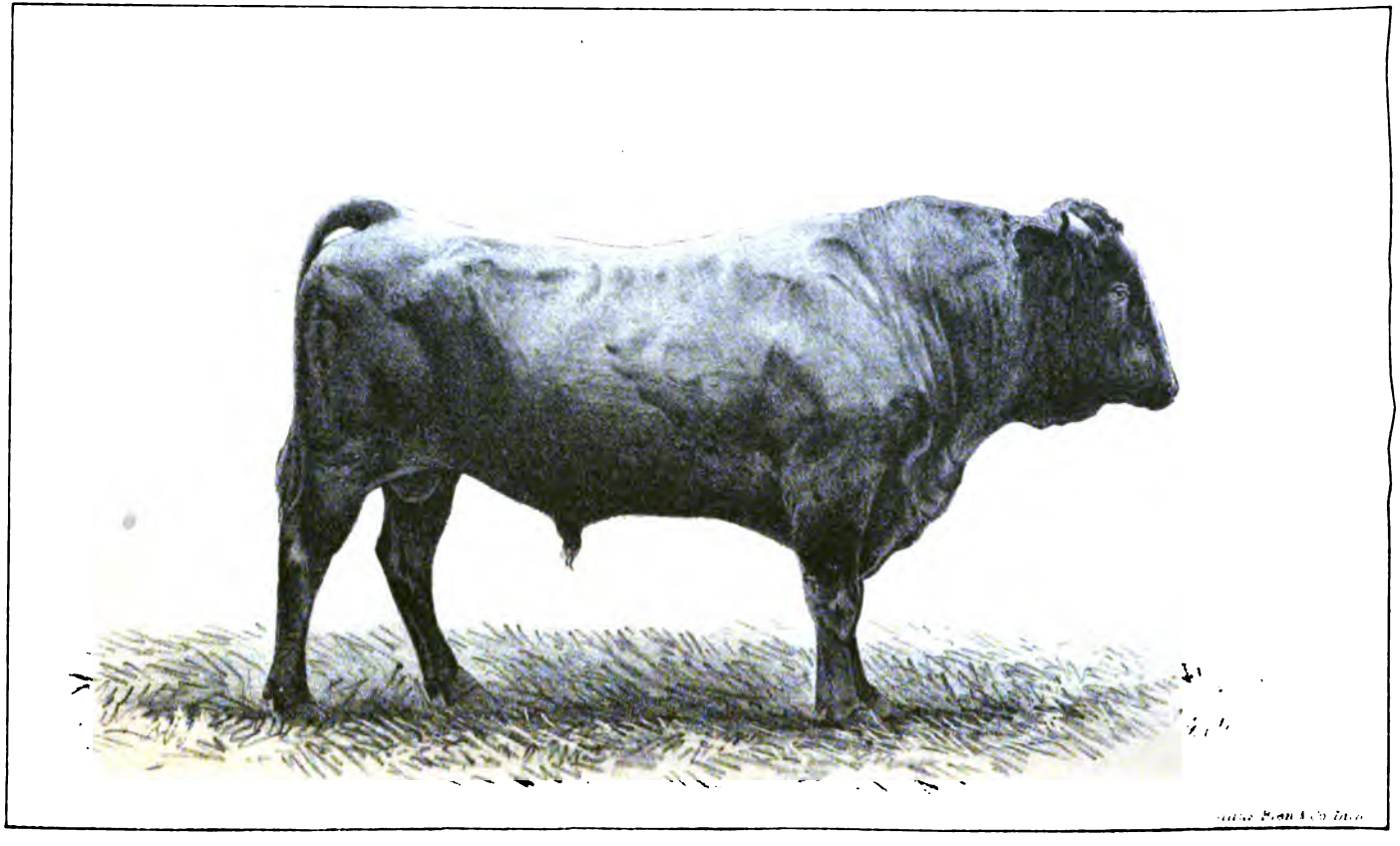
HARZ CATTLE FOR EXPORT TO THE UNITED STATES.

SUPPLEMENTARY REPORT BY CONSUL FOX, OF BRUNSWICK.

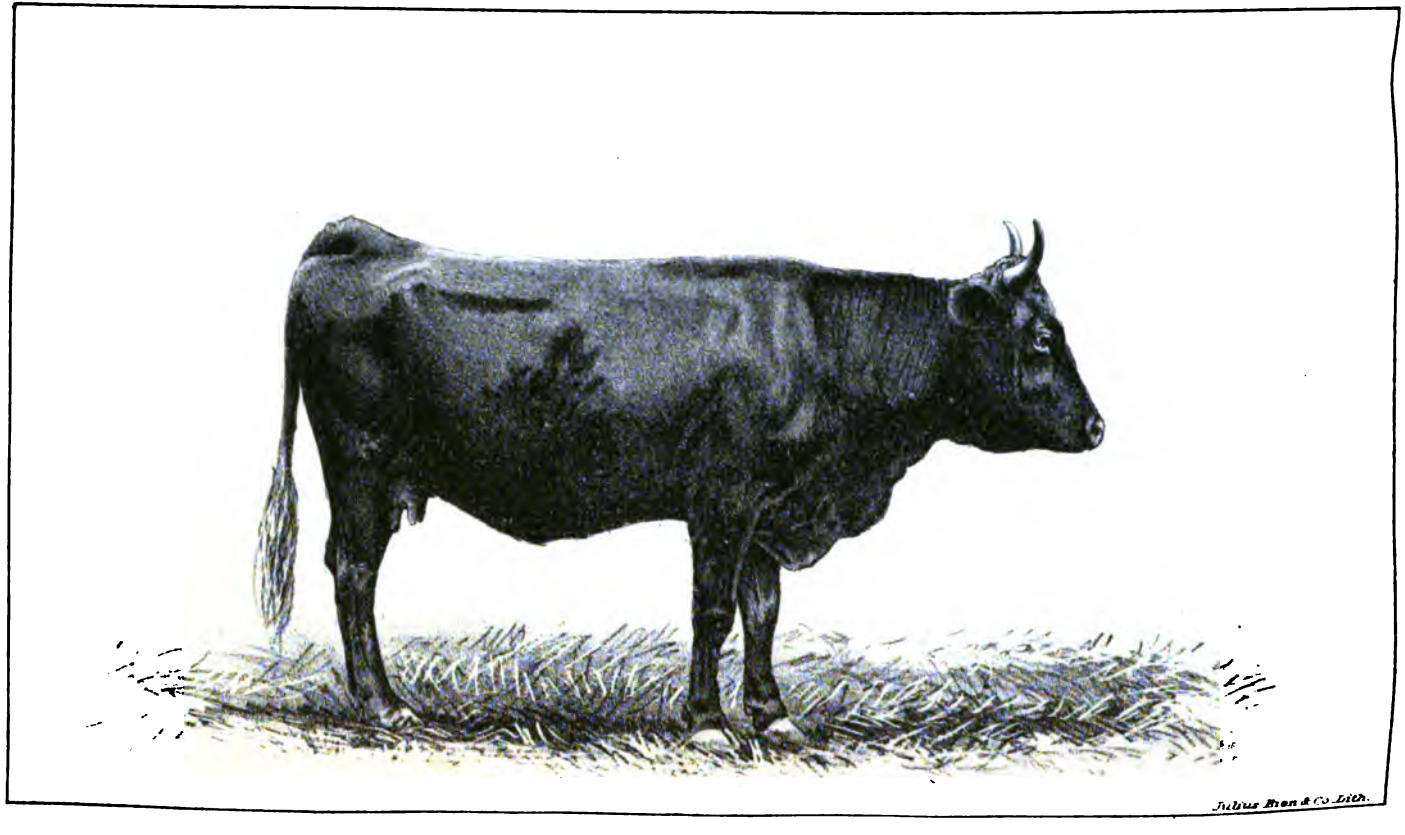
Supplementary to my previous report on the subject, I beg to say that the best Harz cattle to import into the United States for breeding purposes would appear to be young animals, yearling bulls and heifers, and from three to four years old cows. The president of the Brunswick Central Agricultural Association, to whom I am indebted for information upon the subject, advises that in the event of the purchase of such animals being determined upon, the parties interested address Mr. Kreisthierarzt Trolldenier, in Blankenburg, on the Harz. This gentleman is a member of the official commission charged with the selection of breeding animals for the duchy.

The price of the cattle will be about as follows:

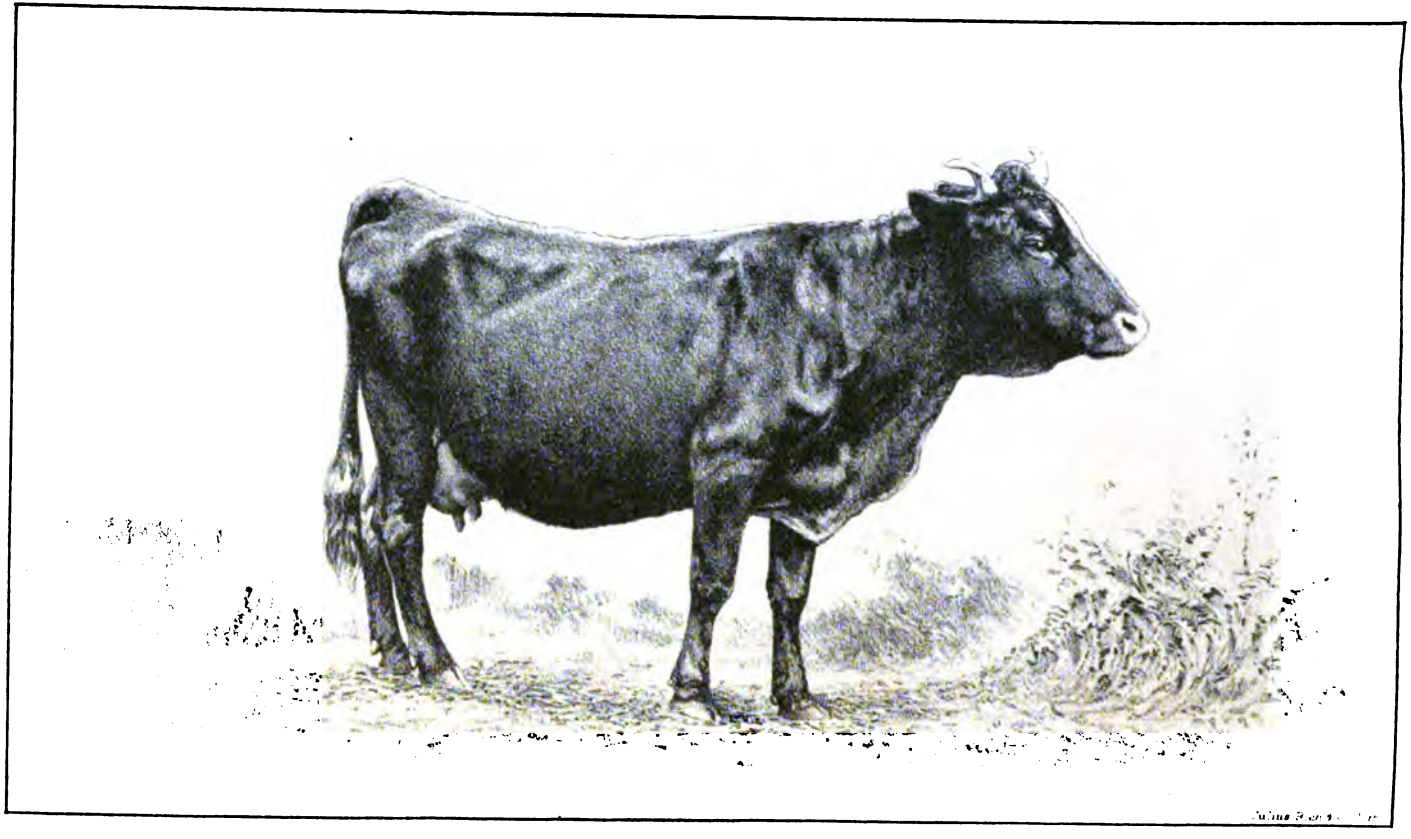
Yearling bulls	$47 60
Yearling heifers	35 70
Pregnant heifers	57 12
Young cows	83 30



HARZ BULL



HARZ COW



HARZ COW

Cost of transportation from Blankenburg to Hamburg and Bremen, respectively:

	Hamburg.	Bremen.
Single	97 49	97 04
Car-load (10 cows or 12 heifers)	27 11	23 97

Nine square meters is taken as half a car-load, in which four cows or five heifers can be placed. The person accompanying must be provided with a third-class railway ticket.

WILLIAMS C. FOX,
Consul.

UNITED STATES CONSULATE,
Brunswick, January 18, 1884.

SPECIAL STATISTICS CONCERING HARZ CATTLE.

The following information was requested in order to properly locate, under similar conditions in the United States, such foreign domesticated animals as have proved by long experience to have been profitable in their native homes:

Annual average quantity of milk	liters*	1,200 to 1,600
Quantity of milk to 1 pound of butter	do	11 to 12
Quantity of milk to 1 pound of cheese	do	3
Live weight (cow)	pounds	700 to 800

Methods of housing: In summer the cows are driven into sheds at night; the heifers remain in the fields. On account of the scarcity of straw the animals stand on boards on which sawdust is strewn.

Feeding: Hay, with a supplement of corn.

Breeding: Breeding very extensive. Calves are suckled by the mother from six to eight weeks.

Handling products: The milk is placed in earthen pans; after the cream has been taken off, it is heated; small round cheese (Harzkäse) are manufactured from the curd.

CATTLE IN THE GRAND DUCHY OF HESSE-DARMSTADT.

REPORT BY COMMERCIAL AGENT SMITH, OF MAYENCE.

DESCRIPTION OF DUCHY.

I have the honor to make the following statement in response to circular instruction of the 18th July last, received October 3.

The Grand Duchy of Hesse-Darmstadt, within which this consular office is situated, lies between the degrees of 49° 24′ and 50° 51′ north latitude, and 25° 32′ and 27° 19′ east longitude, at the northern extremity of the upper valley of the Rhine, which stretches from Basle to Mayence, possessing a length of about 190 miles and a breadth of about 14 to 28 miles, with an elevation above the sea at Basle of 800 feet, and at Mayence of 268, and sinking from south to north. In Hesse-Darmstadt this valley has its greatest width and lowest depression.

The duchy is made up of three provinces, two of which are south of the river Main, and one north of it; between which two divisions runs

* 1 liter = 2.113 pints.

a narrow strip of Prussian territory, while the Rhine flows between the two southern provinces, which provinces are known as Starkenburg, Rhine-Hesse, and Upper Hesse. The area of the entire duchy amounts to 1,897,254.71 square acres, 746,285.22 in Starkenburg, 339,535.06 in Rhine-Hesse, and 811,434.43 in Upper Hesse; upon which, in 1880, lived 636,340 human beings; 394,574 in Starkenburg, 277,152 in Rhine Hesse, and 264,614 in Upper Hesse. Of the 1,897,254.71 acres mentioned, 1,812,358.63 were devoted to agricultural, pasturage, vineyard, or forest purposes, as follows:

Provinces.	Farm and garden land.	Grass, meadow, and pasture land.	Vineland.	Forest land.
	Square acres.	*Square acres.*	*Square acres.*	*Square acres.*
Starkenburg	312, 869. 105	85, 453. 69	1, 664. 36	318, 987. 13
Rhine-Hesse	264, 536. 165	15, 150. 65	23, 101. 46	16, 337. 40
Upper Hesse	368, 088. 125	147, 860. 45	45. 27	262, 714. 83
Total in duchy	946, 093. 39	248, 464. 79	24, 811. 09	592, 989. 36

Starkenburg can be best designated as the district lying between the Rhine, Main, and Neckar, by which rivers it is almost completely encircled. The valley of the Rhine forms the western part of the province, to which on the north the valley of the Main is adjoined, while to the east of the former of these valleys and in a southerly direction from the latter runs the Odenwald Mountain range. This Odenwald is a wooded mountain district between Darmstadt and Heidelberg, and has a length of about 40 miles and a breadth of from 24 to 30. Its highest points are 1,959, 1,869, 1,834, 1,679, and 1,624 feet, respectively. More than one-half of Starkenburg is of a flat character, consisting, for the most part, of a sandy soil, which toward Odenwald seems to be much mixed with the remains of rocks of a primitive and volcanic origin, by which its bearing capacity is materially raised. Small scattered tracts of clay, clay marl, loam, and turf also appear, which bring about a high degree of fertility. In its most northerly part, in its foreparts, and throughout the Gersprenz Valley the Odenwald exhibits an exceedingly rich loamy soil; in its entire western part, so far as agriculturally available, it possesses chiefly a loamy to clayey soil; while in its entire eastern and southeastern parts a commoner loamy soil of colored sandstone prevails.

Rhine-Hesse is the most fertile of the three provinces, and the smallest. It is of a hilly nature, and is bounded on the north and east by the Rhine. Its soil is composed of intermingled areas of calcareous marl, clay marl, porous silicious earth, and chalky loam, not plastic, and quartz-sand. The soil of the province is throughout very rich, but suffers in certain places from dryness.

Upper Hesse lies high above the sea, and has no large plains. It is in part of an undulating character, and partly of a rough, unfertile mountainous nature. The eastern and western divisions of the province are wholly unlike, the soil of the western portion being very fertile, while that of the eastern is very poor.

CLIMATE OF HESSE-DARMSTADT.

In Starkenburg, in the valleys of the Rhine and Main, the climate is in general of a mild South-German type, which, in consequence of the vicinity of the wooded Odenwald and the influence of the Rhine and

Main, are subject to weather changes, and especially to fogs, while that part of the flat land lying between the Rhine and Odenwald, which is without forests, suffers in summer at times from dryness, because the storms and clouds upon passing the Rhine hasten to the Odenwald. The Odenwald, with slight exceptions, possesses a very fine mountain climate that is mild. The climate of Upper Hesse is much rawer than that of Starkenburg, and more like the climate of Northern Germany. Rhine-Hesse, hilly, poorly watered, and almost forestless, is a warm vineland, whose soil and air become very warm at midday during the summer months and quickly cool at eventide, so that in the spring-time frosts at night are often productive of much damage to vegetation. The average temperature, fall of rain, &c., of Hesse-Darmstadt, taken from the observations of fourteen years, from 1866 to 1879, inclusive, at Darmstadt, Starkenburg, Mayence, Rhine-Hesse, and Giessen, Upper Hesse, are:

Average temperature.

Seasons.	Darmstadt.	Mayence.	Giessen.
	° *R.*	° *R.*	° *R.*
Winter	+1.31	+0.3	+0.28
Spring	7.79	7.14	6.62
Summer	15.00	15.31	13.50
Autumn	7.98	7.81	6.88
For the year	8.005	7.642	6.840

Average fall of rain.

Seasons.	Darmstadt.	Mayence.	Giessen.
	c. c.	*c. c.*	*c. c.*
Winter	14.23	12.69	16.28
Spring	15.59	13.82	13.15
Summer	21.84	19.26	19.85
Autumn	16.00	15.12	16.29
For the year	68.56	60.89	65.57

Average number of rainy and snowy days each year.

Season.	Darmstadt.		Mayence.		Geissen.	
	Rainy.	Snowy.	Rainy.	Snowy	Rainy.	Snowy.
Winter	39 40	14. 80	31. 00	13. 10	38. 50	18. 00
Spring	47 14	4. 93	40. 80	4. 93	42. 00	6. 08
Summer	49. 01	.....	43. 90	.....	48. 21	.....
Autumn	45. 50	3. 80	38. 00	1. 70	43. 50	3. 80
For the year	181. 04	23. 53	152. 80	10. 73	172. 21	27. 28

CATTLE IN THE DUCHY.

Hesse-Darmstadt is adapted to the raising of cattle, but, in the translated language of the general-secretary of the Duchy, "the breeding of cattle in Hesse is an old, but alas, in no wise a very satisfactory story." The natural types of the cattle of the Odenwald* and Vogelsberg,* as well as those of the Donnersberg,* were of such a character that they

* Mountains in Hesse.

would have furnished an excellent basis for breeding purposes had the subject received that attention from the authorities and people that it eminently deserves, but, except by a few small farmers and communities, the matter has been neglected to such an extent that it has become a question of serious concern to all. The matter is further complicated by the fact that the small territory constituting Hesse-Darmstadt is owned by a host of proprietors, of which there are 165,535, or about that number, of whom 59 per cent. control less than 1 hectare;* 25.20 per cent., between 1 and 5 hectares; 10 per cent., between 5 and 10; 3.30 per cent., between 10 and 20; while only 2 per cent. hold more than 20 hectares. This, while advantageous to the people in one respect, is very unfavorable to cattle-raising. The Odenwald race has almost entirely died out, and the Vogelsberg, a small, strong species, good for food and draft purposes, is in nearly a similar condition. The Starkenburg and Rhine-Hesse cattle are now being somewhat improved in isolated quarters through the introduction of Simmenthal bulls. In years past the various agricultural associations endeavored to raise the character of the cattle of the Duchy, but want of proper fodder and other causes conspired to thwart their aims. The Schwytz Brown cattle were first tried until 1869, but it was found that they did not cross well with the native cattle of Hesse, and the spotted cattle of the Simmenthal, between which and the native races of Hesse a relationship is said to exist, are now being used with much better success. After this experience with the Schwitz the coarse, red-spotted cattle of the Bernese Oberland were selected, but as the milk-giving capacity of this species had received little or no attention from the Swiss it was discovered that a mistake had been made in turning to this variety, and in recent years the finer, yellow-spotted cattle, especially the Saanenthal, have been chosen in order to bring about an increase of milk, which trial has not been long enough in operation to state results to any extent. More attention is also being now given to the feeding of cattle than formerly. The chief obstacle, as already stated, in the way of successful breeding has been the want of ample pasturage, by reason of the small size in general of the farms in Hesse, and also the lack of encouragement from the state.

CATTLE STATISTICS OF HESSE-DARMSTADT.

According to an enumeration of cattle made in 1873, there were then in the Duchy the following number of animals:

Provinces.	Young cattle 6 months to 2 years old.			Animals over 2 years old.				Grand total.
	Calves less than 6 months old.	Between 6 months and 2 years.	Bulls for breeding	Total.	Breeding steers.	Other steers and oxen.	Cows.	
Starkenburg.....	12,104	23,156	524	62,026	624	3,913	57,499	97,296
Upper Hesse	15,748	31,567	661	79,909	717	3,737	70,455	127,224
Rhine-Hesse.....	5,423	11,113	455	42,993	342	1,017	41,634	59,529
Total Grand Duchy.	33,275	65,836	1,640	184,938	1,683	13,667	169,588	284,049

The Grand Duchy has in round numbers about nine hundred and forty thousand persons to nourish, who require per head on an average

*One hectare is a very little less than 2½ acres.

about 120 kilograms* of milk, 15 kilograms of butter, and 7.5 kilograms of cheese, amounting in all to about 600 liters† of milk each, and 560,000,000 liters for the entire population, that is, more than double the quantity which the Duchy itself produces, which in 1876 amounted to only 264,983,824 liters. According to the same statistics the average quantity of milk per cow was:

	Liters.
In Starkenburg, about	1,680
In Upper Hesse, about	1,500
In Rhine-Hesse, about	1,900
In Grand Duchy, about	1,650

It is also estimated that Hesse is obliged to draw annually from outside sources the flesh of about seven thousand five hundred and fifty oxen.

Hesse-Darmstadt thus presents a poor field to the view of those who are seeking fine types of breeding-cattle.

JAS. HENRY SMITH,
Commercial Agent.

UNITED STATES COMMERCIAL AGENCY,
Mayence, November 23, 1883.

CATTLE IN THE RHINE PROVINCE.

REPORT BY CONSUL SPACKMAN, OF COLOGNE.

In reply to circular of July 18, 1883, requesting information as to cattle-breeding in this consular district, I have the honor to report as follows:

There is no cattle-breeding of any importance in the immediate neighborhood of Cologne. The stock in the greater part of this district is not sufficient for home demands, but the deficiency is generally supplied by Holland. In the whole Rhine Province the total number of cattle is about 1,700,000, including from 800,000 to 900,000 cows. The principal breeds are the Birkenfeld, Westerwald and Eifel, named after the sections of country in which they are raised.

THE BIRKENFELD BREED.

The best kind for export to the United States is the Birkenfeld. If well fed and properly cared for they grow very large and give a good supply of milk, they being stronger than the other kinds and better able to endure severe weather. This species is the same as the celebrated Oldenburg breed, Birkenfeld now belonging to the Duchy of Oldenburg and being a narrow strip of ground near Treves and south of the river Moselle. The cattle were formerly sent from Oldenburg to Birkenfeld, and have since remained a pure breed. At the age of four years the best animals command the following prices: For a cow, $125 to $150, and for an ox or bull, $175 to $190. A one-year-old bull costs from $100 to $115.

THE WESTERWALD BREED.

The Westerwald is a mountainous region east of the Rhine and between the valleys of the Sieg and Lahn, and the cattle in this district

* A kilogram = 2.2046213 pounds avoirdupois. † A liter = 1.76077 pints.

are smaller than those in Birkenfeld and the Eifel, but the quality of their meat is much finer. A good cow costs about $140, and an ox or bull $165, while a one-year-old bull can be bought for $75.

THE EIFEL BREED.

The Eifel is also a mountainous district, about 45 miles in length and 24 miles in breadth, situated between the rivers Rhine, Moselle, and Roer. The cattle here are very strong, and are used for agricultural purposes and often in place of horses. They are not recommended for export, on account of the peculiar country and soil to which they are accustomed. They cost about the same as the Birkenfeld breed, although they are much smaller.

HOUSING AND FEEDING.

The generality of these different breeds of cattle are kept in stables during a greater part of the year, and graze in the meadows after the grass is cut. Plenty of good water is indispensable to the health of the animals. While in stables, and if in the neighborhood of sugar manufactories, they are fed upon the remains of sweet turnips, which are considered very excellent for food, and in other places they receive hay, bran, the refuse from distilleries, cut turnips, and oil and linseed cakes.

The only species which is in the open air most of the year is the Birkenfeld or Oldenburg. They give milk for almost nine months of the year, and during the first three months as much as the remaining six together, the quantity varying in the first months from 15 to 18 liters per day.

CATTLE-MARKET OF NEUSS.

The principal market for the sale of cattle is in the city of Neuss not far from Cologne. Animals are sent there for sale from the Rhine Province, Birkenfeld, Holland, &c., and a large proportion of the buyers are Belgians.

SHIPMENT OF CATTLE TO THE UNITED STATES.

The most convenient and cheapest way of sending cattle to the United States from here is by rail to Antwerp, a distance of 157 miles from Cologne, and from there by steamers to New York. The cars vary in size, but one of 18 square meters accommodates nine cattle, and costs 88.80 francs or $17.14 to Antwerp. A man must be employed, at the rate of $1.10 per day, to accompany the animals, and 75 cents is charged for cleaning and disinfecting the car at the end of the journey. Hay for feeding costs 40 cents, making the total expenses to Antwerp $19.39, or $2.15 for each animal. From there they can be shipped to New York in the steamers of the White Cross Line at the following rates: £6 (or $29.20) each for full-grown cattle, £5 (or $24.33) each for yearlings, and £1 (or $19.47) each for calves. These sums include all charges.

The annexed statements give the statistics for cattle-breeding in this consular district, as far as I have been able to obtain them.

SAMUEL SPACKMAN,
Consul.

UNITED STATES CONSULATE,
Cologne, December 19, 1885.

General statistics concerning Rhine Province cattle.

Name of breed.	Annual average production of milk.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Name of country.	Size at maturity.			Live weight.		
					Cow.	Bull.	Ox.	Cow.	Bull.	Ox.
	Pounds.	*Liters.**	*Liters.*		*Feet.*	*Feet.*	*Feet.*	*Lbs.*	*Lbs.*	*Lbs.*
Birkenfelder..	9,768	16	8	Birkenfeld...	4⅛	4⅜	4⅜	1,900	2,400	2,400
Westerwalder.	7,600 to 8,250	16	8	Westerwald .	3 11/12	4⅛	4⅛	1,200	1,800	1,800
Eifel.....	7,700 to 8,250	16 to 17	8	Eifel.....	4 1/12	4⅛	4⅛	1,400	2,000	2,000

*A liter is .22009687 of a gallon.

Topography.

Name of country.	Altitude.	Mean temperature.	Summer.	Winter.
	Feet.	° *F.*	° *F.*	° *F.*
Birkenfeld.....	980 to 1,650	44 to 47	61 to 63	26 to 30
Westerwald	980 to 2,300	44 to 47	61 to 63	26 to 30
Eifel.....	980 to 2,300	44 to 51	61 to 66	26 to 35

Name of country.	Soil.	Substratum.	Cultivated grasses.
Birkenfeld.....	Chalky	Slate	Fine grass in cultivated districts, and in many parts of the country fine lucern clover.
Westerwald....	Basalt	Basalt	Fine grass and common clover.
Eifel.....	Volcanic tufa, basalt, and trachyte, and in some parts of the Eifel trias formation.	Volcanic tufa, &c.	Short grass and white clover.

DESCRIPTION, ETC.

Birkenfelder: This breed is of reddish-yellow (more red than yellow) color; the cow is about 4 feet 6 inches high and very long in proportion to height; the dewlap is very large, horns of ordinary size; they arrive at maturity in four years, or after changing teeth. The product is 4,800 liters of milk or 600 pounds of cheese; meat, 1,025 pounds for cow and 1,250 pounds for ox (dead weight). For the first four or five weeks calves receive milk direct from the cows; afterwards they are fed upon a mixture of ordinary milk and linseed cake. Animals are only housed during the severest winter weather, and then placed in ordinary stables. In winter the animals are fed upon white turnips, bran, refuse from distilleries, oil and linseed cake, and in summer upon grass and hay.

Westerwalder: This breed is fawn color, with white faces or head, very large neck and dewlap, and very long in proportion to height; the horns are not very long and stand upright. Age at maturity the same as Birkenfeld. The product is 3,700 to 4,000 liters of milk or 460 to 500 pounds of cheese; meat, 650 pounds for cow and 950 pounds for ox. Directly after their birth calves are taken from the cows and fed with good milk for the first month, and afterwards with a mixture of sour milk and buttermilk; if this should prove too much of a laxatixe the sour milk is mixed with a paste made of linseed powder and warm water. The animals are housed most of the year, but are turned out in the fields after the grass is cut. The feed is bran, sweet turnips, and beets.

Eifel.—Dark brown color, with white spots, ordinary form, the neck and dewlap not being so large as the Birkenfeld. Age at maturity same as above. The product is 3,800 to 4,000 liters of milk or 475 to 500 pounds of cheese; meat, 750 pounds for cow and 1,050 pounds for ox. The calves of this breed are treated and fed in the same manner as the Westerwalder. The animals are kept in ordinary stables during the severest winter weather; their food consisting of turnips, refuse from distilleries, &c.

The principal markets for the sale of butter and cheese are in Cologne, Coblence, and Mayence, where they are sent by boat or rail.

DENMARK.

DANISH CATTLE.

REPORT BY CONSUL RYDER, OF COPENHAGEN.

I have herewith the honor to inclose, duly filled out, the form annexed to the circular from the Department under date of 18th July last, with reference to cattle-breeding, and at the same time have the honor to present the following observations relating to this matter:

Denmark possesses two breeds of cattle, namely, the Red Danish and the Black Spotted Jutland. The first named constitute the cattle herds of the islands, as also of those of a few districts in the southern part of Jutland, whilst the Black Spotted are to be found throughout all the Jutland districts. Side by side with these two breeds are to be found, in a few districts, more especially in Jutland, some of the Shorthorn cattle.

THE RED DANISH CATTLE.

This is one of the most noted milking breeds in existence. This breed has been formed by improving on the well known-Angeln breed from Schleswig, which, with more abundant foddering and care, has in Denmark been brought to greater size and with larger development in milking qualities.

The Red Danish breed, when full grown and in good milking condition, has a weight of from 900 to 1,050 pounds and as a rule their first calving season takes place at the age of two and one-fourth to two and one-half years. After the first, and in part after the second calving periods, they do not give their full yield of milk, but neither do they require such generous foddering. There are large numbers of these cows which give an annual yield of 8,000 pounds of milk; and it is not infrequent amongst the best cattle herds to find cows giving 10,000 pounds of milk in the course of a year. In the bountiful-fed herds it is frequently a matter of difficulty to keep the cow dry some time before calving. In order, however, to spare and strengthen the animal, every method is employed to run her dry for the space of six to eight weeks.

In the inclosed form of the cattle circular, it will be observed that the average annual milk yield is put down at 6,500 pounds; but this is to be understood as being the average twelve months' yield during the cow's entire life period; so that its yield whilst a young cow is also included therein.

The Red Danish cattle are almost entirely used as dairy herds, and, while in good milking condition the cow remains thin. Not only does she convert all her food into milk, but appears also to perform the same operation with the fat and muscles of her body; but so soon as she falls off in her milking qualities and begins to run dry she fattens easily.

BLACK SPOTTED JUTLAND BREED.

These cattle are about the same size as the Danish red breed, although of somewhat heavier build, and with bodies of slightly greater breadth and depth.

The Jutland breed of cattle are used both for dairy and meat purposes, and are exported annually in large numbers in a fattened condition from Jutland to the English markets. The midland, northern, and more especially the western districts of Jutland have from early times been noted for the superiority of their breeds and a large number of heifers and young cows are every year bought up in these districts for removal to other parts of the Kingdom.

During the last fifteen to twenty years the Jutland breed has been greatly improved, both in regard to milking qualities and in its earlier maturity.

The average quantity of its milk yield as given in the inclosed circular form, is attained by all good cows of the Jutland breed, and this amount is exceeded by not a few of them. At the same time this breed is of such thriving character that the bullocks can attain a weight of 1,000, to 1,100 pounds at the age of one and one-half years, and a weight of 1,300 to 1,400 pounds at the age of two and one-half years.

The object constantly kept in view in Jutland is the development of milking qualities, whilst retaining at the same time a broad, deep, and well built body.

NUMBER OF CATTLE IN DENMARK.

In the year 1881 there were in the Danish islands 586,497 head of cattle; in Jutland, 883,581—total in Denmark, 1,470,078.

EXPORTS OF DANISH CATTLE.

The export of cattle from October 1, 1881, to September 30, 1882 was 99,759 head, with an average export for the decennium from October 1, 1871, to September 30, 1881, of 84,550 head.

Of these exports about 60,000 head, annually are sent to the English markets in fattened condition, and about 30,000 to Germany as lean cattle.

DANISH CATTLE FOR THE UNITED STATES.

Parties desirous of introducing Danish cattle into the United States as breeding stock will meet with no difficulties in the way of transportation, as there has for some years been in existence a regular line of Danish steamers running between Copenhagen and New York, carrying emigrants and cargo at about the current going rates of frieght from the English ports.

The cost of the Danish cattle will also be considerably less than for the English Shorthorn, Ayrshire, and Durham breeds.

HENRY B. RYDER,
Consul.

UNITED STATES CONSULATE,
Copenhagen, December 31, 1883.

Special statistics concerning cattle in Denmark.

	Red Danish cattle.	Jutland cattle.
	Pounds.	*Pounds.*
Annual average production of milk	6,500	5,800
Milk to 1 pound of butter	28	26
Live weight:		
Cow	900 to 1,450	900 to 1,100
Bull	1,200 to 1,400	1,400
Ox		1,200 to 1,400

Red Danish cattle: Color, red; product, milk, butter, and skim cheese. They have been bred pure in Denmark for thirty to forty years. Origin of breed, Angel Schleswig.

Jutland cattle: Color, black; age at maturity, three to three and a half years; weight, 800 to 900 pounds; product same as Red Danish. The origin of breed is Jutland; they have always been bred pure.

The cattle are housed in cow-sheds from October 1 to the middle of May. The cows and heifers are tied into the stalls. The feed for a cow in milk is 8 to 10 pounds of corn and like, 8 to 10 pounds of hay, straw and some roots (about 20 to 40 pounds of roots). Heifers are put to the bull at fifteen to eighteen months old. The buttermilk and whey are used for feeding pigs.

Topography, &c.: Altitude, slight; mean temperature, 74° C.; summer, 15.4° C., winter, 0.5° C. Soil, clay; the subsoil consists of a marly clay, of glacial origin, contains large bowlders, and known as "bowlder clay." Timothy, clover, rye grass, &c., are cultivated.

THE ANGELN CATTLE OF DENMARK.

REPORT BY CONSUL RYDER, OF COPENHAGEN.

I have the honor to transmit a report on cattle of the Angeln breed in Denmark.

A woody landscape, with comparatively small fields, surrounded by sheltering live hedges; a fertile, genial soil, with good grass growth, and cattle, which, from remote times, have always been raised for their milking qualtities, with a full ignoring of meat production, and, in former times, with a contracted breeding increase, as also a sparse winter foddering, and finally, a certain care taken by the population in watching over the good descent of the cows on the mothers' side—these are the chief points from the influences of which the Angeln breed has been formed.

There may have been other causes of which I am ignorant; for example, special qualities of soil and grass, which might have influenced this interweaving; but to allow that the Angeln breed springs from doubtful crossings in remoter times, that the breed sprung from English cattle which one of England's kings had presented to his sister, the dowager duchess of Holstein, is not needed to show their peculiar qualities. A close observation will show that the same causes which in these days keep up the Angeln breed can be accepted as having been sufficiently potent in course of time to form the breed.

As the most prominent features of the better class of animals may be mentioned a fine, and, considered as milking cows, a regular construction of bone, to which may be added a somewhat small and delicate head (with long lower jaw), also fine, white, slightly up-curved horns, a lean and rather angular body, thin, fine neck, a fine and, frequently, loose, smooth skin, and finally well-developed milk organs, and, as a rule, large hind quarters. The Angeln cow, as compared with the island cattle of this country, may be considered as under the average size.

According to reports the weight of a four-year-old bull or five-year-cow averages 750 to 800 pounds, which may, however, be considered as somewhat high.

These well-known features of structure in the Angeln cows are in such close connection with the general life-conditions of the race that in all chief respects they easily allow of being guided thereby.

Owing to the great stress laid on the milking properties of the cow, and to the fact that the offspring are either sold at a young age for breeding purposes or as lean cows for grazing, for the promotion of the milking qualities, the cattle movement for the meat production as

a general trade has not exercised any important influence on the development of the race, as has been the case in Jutland. The effect of this tendency to form families and races, which is very general in Angeland, must not be estimated too lightly, for it has been the means of keeping the good stock together. In the Angeln breeding the greatest importance is attached to the cow and the least to the bull. The bull here is always young, but this has both its weak as well as its strong sides in land husbandry.

The cattle interests in Angeland have thus in full measure reaped the benefit from the breed, having stood ready and fully developed when the demand of the present day for improvement began to make itself felt, as the neighboring countries, to a large extent, have sought it for breeding. It is only the Dutch cattle which in that respect offer opposition to the Angeln breed.

When the Angeln breed was first introduced into the country can scarcely be stated with any certainty. The oldest known herds date from thirty to forty years back, but it is possible that the importation took place earlier than that in the island of Fyen, which was at that time the highway for cattle from South Jutland to the islands and to Copenhagen.

Even if the chief part of the cattle which came that way were from North Schleswig and Ballum, still it may be supposed that some Angeln cattle may have followed the stream. This importation has gradually become very considerable.

Although there have naturally occurred several crossings with the allied groups of cattle in the islands, still it comes probably nearer the truth if one considers the extension of the Angeln breed to be due more to the introduction of the cattle on the spot than to crossing therewith.

The cattle census of this country shows very plainly what part the Angeln cattle play, not only in the islands, but in Jutland.

On taking the census there were ascertained to be of Angeln bulls and bulls of native breed as follows:

Districts.	Angeln.	Native races.
1866.		
In the islands	1,961	10,894
In Jutland	266	4,883
1871.		
In the islands	1,961	7,907
In Jutland	200	4,208
1876.		
In the islands	2,380	7,001
In Jutland	300	4,376

From 1871 the breed of Angeln cattle makes rapid progress; whilst the foddering at the same time becomes more plentiful, and the requirements for a larger milk yield is awakened.

On the islands the Angeln bulls have increased in the last five years 21 per cent. and in Jutland 13 per cent. With this increase it cannot be doubted but that the race has been introduced into unadaptable districts. Accustomed to sheltered fields in its native home, and delicate of structure, it naturally calls for attention and care in its treatment. But it has also been shown that it can thrive well and increase its milking powers, even in a severe climate, when it receives a continued liberal and regular course of feeding the whole year round.

When one is unable to bestow such nourishment on the Angeln cattle, it would be advisable not to keep them, because, just as they are able to make a return for their liberal keep, they are liable to recede where the soil, climate, and natural conditions are unfavorable. Not only do they fall off in their milking qualities, but they sink under attacks of consumption.

When the breed of Angeln cattle began to be cultivated in this country strong, nourishing fodder was far from being common, and even on the larger estates much less fodder was given than in later times.

The ruling principles in breeding were to preserve and to further develop the fineness in the breed, and mainly from a scanty feeding and from the early stage of calving of the young cows this fineness was at times carried to a dangerous extent. Gradually, however, a reaction took place in this respect, and subsequent to the agricultural meeting in Copenhagen in 1869, there commenced a demand for greater body development, whilst at the same time a more liberal foddering became general. But it was also shown that the Angeln cattle did not disown their natural thriving tendencies, for the breed by degrees willingly submitted to the new requirements demanded of them, and even in such herds, where most advancement had been made in the direction of fineness, but where, however, health had been preserved, good results could be obtained.

These movements in breeding Angeln cows, and the results therefrom in later times, are contrary to the belief that when the necessary fineness has been reached in any productive breed and becomes a sign of race or descent, that then a very considerable structural development, both as regards body and bone surface, and therewith a corresponding life existence, may be given to the animal without any sensible loss therefrom in fineness, whilst the producing properties are increased at the same time.

Sufficient attention has not always been given to these points, and those who have either received their views of the Angeln breed from the period when the general desire was for elegance, or from those herds of the present day, where they pertinaciously hold to the same, and who have scarcely paid attention to the movements of the last ten years in the advanced herds of the country, can yet be astonished at what they have noticed in the fineness and so-called one-sided consequences in dairy thrift. In those parts of this country, where one only in the later years has begun to understand what dairy thrift really means, it has been very hard for them to get rid of the scare which the remembrance of by-gone days associated with the ideal of a good milch cow.

The above-mentioned experience in regard to the development of the fine Angeln breed in the last ten years will, however, without any doubt, soon help to dissipate this scare once for all. Even if it be taken for granted that the Angeln cattle in their native home have, as before stated, a weight of 750 to 800 pounds each, which calculation is from 1877, and thus included the progress, small as it is, which the breed has made even in its native home, still this weight is probably not a little above what the fine Angeln cattle weighed from the year 1860. But even if one goes out from 750 to 800 pounds for a five-year-old cow a considerable increase in weight can be seen in the Angeln cattle now in this country.

For the year 1881 the following weights have been given of Angeln cows on a Danish farm, namely, 17 head of cows, 6 five years old, that had calved weighed 912 pounds per head; 14 head of cows, seven 4 years old, that had not calved, weighed 1,058 pounds per head; three-year-old

heifers weighed 820 pounds per head; two-year-old heifers 798 pounds per head.

Gabel places the milk yield of an Angeln cow of 750 to 800 pounds at 2,300 to 2,500 liters of milk. This milk yield was obtained with the following daily fodder: 8 to 10 pounds hay; 3 pounds wheat-bran; 2 pounds peas; 2 pounds oats; 1 pound bruised meal; 10 pounds buts, or else 8 to 10 pounds hay; 5 pounds barley; 3 pounds oats; 2 pounds wheat bran and straw.

It is not stated what the above-mentioned 17 cows that had calved yielded of milk in the year, but it is pretty certain that any 17 head of six-year-old cattle of the farm's herd will yield much more during the year, and which would be equivalent to 6.2 times their weight of body.

If the average weight is taken of one to two year and of two to three year old heifers, together with that of the 17 cows, which probably will not be far from agreeing with the proportions between the older cows and the heifers on the farm, an average weight of 838 pounds will be obtained, and which for an average milk product in the year for the whole herd of 6,100 pounds will give a proportion of about 1:7.2.

Thus there is not only a considerable increase in weight of body but also in absolute and relative yield of milk. Even supposing that the herd on this farm is somewhat superior to those on others, it still does not weaken what has been maintained, as most surely the greatest part of the Angeln herds in this country will be able to show a similar, even though it be a somewhat smaller progress.

HENRY B. RYDER,
Consul.

CONSULATE OF THE UNITED STATES,
Copenhagen April 20, 1882.

BUTTER EXPORT OF DENMARK.

REPORT BY CONSUL RYDER, OF COPENHAGEN.

I have the honor to present a report on the butter exports from this Kingdom to Great Britain, together with the relative position taken by this country under this head as compared with the other important exporting lands.

The steady and extensive progress which has been maintained by this country in this important branch of dairy produce during the last eighteen years is of very striking character, and is brought prominently to light in the following statistical returns, showing the quantities and estimated value in round numbers of the exports in the past years:

Exports of Danish butter from 1866 *to* 1883.

Year.	Quantity.	Value.	Year.	Quantity.	Value.
	Cwts.			*Cwts.*	
1866	67, 305	$1, 526, 000	1875	206, 171	$6, 200, 000
1867	80, 589	2, 033, 000	1876	205, 195	6, 372, 000
1868	79, 437	2. 290, 000	1877	210, 322	6, 550, 000
1869	103, 613	2, 794, 000	1878	242, 427	7, 375, 000
1870	127, 013	3, 628, 000	1879	281, 740	8, 188, 000
1871	140, 857	3, 904, 000	1880	300, 157	8, 637, 000
1872	173, 574	4, 905, 000	1881	279, 625	8, 222, 000
1873	201, 558	5, 840, 000	1882	304, 732	8, 994, 000
1874	226, 053	6, 618, 000	1883	353, 584	10, 457, 000

In connection with this movement it is of interest to take note of the information conveyed through English statistical returns of the butter imports into that Kingdom during the same period from the chief butter-exporting lands, viz, the United States, Belgium, France, and Holland.

It will be sufficient here to give these import returns for the year 1883, which were of the following nature, viz:

From—	Quantity.	Value.
	Cwts.	
United States	120,163	$2,723,000
Belgium	50,638	1,275,000
France	503,299	12,683,000
Holland	988,266	20,433,000

Upon critical investigation, however, of the returns for previous years, it is seen that the butter exports from the United States have been subjected to considerable fluctuations; that whilst these exports in 1869 only amounted 17,203 cwts., they had in 1876 reached up to 118,131 cwts., continuing still on the increase for some years, when in 1879 they had attained their maximum point of 301,054 cwts. From that date they have apparently been on the decline until in 1882 they are only seen to amount to 51,246 cwts., again rising, however, in 1883, to 120,163 cwts. The imports from Belgium are likewise seen to have been retrograding. They would appear to have reached their highest stage at the close of the sixth decade to the commencement of the seventh, when, in 1871, the imports from that country are credited with 94,539 cwts. All the subsequent years show a gradual decline, and at the present day they figure for little more than one-half of the amount attained in 1871.

The butter exports from France to Great Britain have, on the other hand, been maintained without any perceptible changes, whilst the exports from Holland are found to have met with a very considerable increase; but this rapid increase is more apparent than real. It is without doubt in great measure due to the very large production and export from that country in the latter years of spurious butter, and which in the English returns are not classed under a distinct rubric, but are indiscriminately mixed up with real butter; thus, whilst the exports from Holland in 1872 were only 269,091 cwts., in the year 1883 they figure for the large amount of 988,266 cwts. As before mentioned this great increase is chiefly made up by the heavy exports of butterine, &c.

In instituting a comparison between the exports from Denmark for the year 1883, with those from the other previously mentioned lands, it will be seen that the exports from this Kingdom are nearly three times as large as the exports from the United States, nearly seven times as large as those from Belgium, and are only inferior to those from France and Holland.

It is at the same time of interest to examine the estimated values which are placed upon the butter from the different countries in the English statistical tables, these valuations in the returns for the year 1883 being denoted as follows, viz:

	Per cwt.
Danish butter	$29 50
French butter	25 00
Belgian butter	25 00
United States butter	22 50
Dutch butter	20 00

The Danish butter thus being placed at the head of the list as regards value and at considerably higher rate than its competitors, next coming France and Belgium, thereafter the United States, and last of all Holland; the low values for this country being again influenced as before remarked, by the large amount of spurious butter included in the returns. The total estimated value of these butter exports from the above-mentioned five countries in 1883 closely approached $48,000,000.

Whilst passing these figures under review it must not, however, be forgotten that the estimated values of these tables are based upon the aggregate imports from each country, and that it chiefly tends to show that the high position held by this Kingdom is mainly owing to her exports consisting on the whole of a high standard class of butter; whilst a far greater proportion of inferior butter is included in the exports from the other countries, and it must on no account be taken for granted from these tables that Danish butter at all times commands the highest prices in the English markets, as it is a well known fact that it by no means obtains the prices paid for the fresh, sweet, unsalted classes of English and French butter.

From France the imports may be said to consist of two kinds. The one coming from the northern part of that country is sweet and unsalted and made up in pieces of 2 to 3 pounds weight, packed in small boxes of willow bark, whereas the other sorts are from the collected purchases from the smaller land-owners throughout the country, but salted and packed in ordinary butter casks. This sweet, unsalted butter of England and France can at all times command in the English markets the higher price of 4 to 6 cents per pound above that of the very finest quality of Danish butter.

In the latter case a small quantity of this sweet, unsalted butter, packed in the same way as the French article, has likewise been exported from this country; but the long sea route and the present restricted steam intercourse with the English ports, have prevented any great development in the manufacture thereof, whilst the French producers, being on the other hand favored by a short sea route and almost daily steam communications, are enabled to secure the full advantages of these extreme prices. The sweet, unsalted description of butter is almost exclusively directed to the great London market, whereas in the great Manchester market and other large northern towns in England, Danish, French (salted), Dutch, and American butter is chiefly to be met with.

Without question the sweet, unsalted butter must be considered as the finest and most renumerative description for export, and which the producers in the northern parts of France are fully alive to. Here it is equally felt that more satisfactory results could be obtained for the Danish butter if it could only be exported with all safety in the sweet, unsalted state, but, unfortunately, it is too liable to injury during the lengthened period of transport under the present restricted means of steam communication between the two countries. The great importance of a more rapid and more frequent intercourse with the great London market is now so keenly felt here by the agricultural classes that petitions have been sent in from all the agricultural societies to the home ministry for subsidies in aid of proposed line of steamers to run from the port of Esbjen, on the west coast of Jutland, with a biweekly service. It is calculated that a sea voyage from that port to London may be accomplished on ordinary occasions within thirty hours, and that, with an appropriate regulation of the time tables for the different railways in connection with Esbjen, that the entire transport can be made in such short space of time as to allow this description of unsalted but-

ter to be brought on the London market in perfectly sound condition; and it is now earnestly hoped by the agricultural community that the so long desired step in futherance of a fuller development of this important branch of their interests may in the very near future be carried out in one way or another with successful results.

HENRY B. RYDER,
Consul.

UNITED STATES CONSULATE,
Copenhagen, September 29, 1885.

UNION DAIRIES IN DENMARK.

REPORT BY CONSUL RYDER, OF COPENHAGEN.

I have herewith the honor to present a report on a subject which is being much discussed in agricultural circles here, as to the advantages or otherwise derived by the class of small landed proprietors, in connection with their relations to the present extensively developed system of union dairies.

It is now taken for granted that butter produce, in so far as it may be intended for exports, must be packed in casks of a net weight of 75 to 100 pounds, and that it is useless to maintain that the butter is equally as good whether it is sold in half firkins or in packages of larger size, for the simple reason that so long as English customers demand the larger packing, so long it will be necessary to comply with their wishes. The small producers thus find themselves unable to complete the delivery of their butter in such large packages without incurring the risk of finding the lower contents losing its freshness before the packing can be completed, and are compelled to choose between two modes of procedure viz, either they must dispose of their milk to the union dairies, which collect their supplies from many small producers, working the same under one system and producing butter therewith on a large scale, by which means butter can be packed and brought into the trade exactly in the same way as from the large estates, or it is left to these small producers to pack their own butter, selling it in small jars to the neighboring dealer, who purchases butter in these small packages for the purpose of repacking after careful sorting into casks of the required size, and then bringing them into the trade for export.

This last method, in order to meet with successful results, demands that the butter production amongst the small farmers shall have attained such development as to admit of a sufficient supply of good and uniform character being obtainable, so that the dealer, with careful selection, will be enabled to offer this jar butter when repacked in casks, in the same good uniform condition as butter of first class quality from the large estates.

The Union Dairies, in the beginning of their career, had many difficulties to contend with in their attempts to produce butter of good quality; but with the introduction and great development of the centrifuge system, these obstacles may now be said to be removed, inasmuch as the centrifuge can thoroughly separate the cream from the milk in a short time, even in such instances as where the milk may have lost much of its freshness from the longer period which may have elapsed during the lengthened stage of its transport to the dairy. Owing to this improved system of working the milk, the Union Dairies have largely developed during the last four years in all parts of the Kingdom, and such sanguine expectations are entertained of their operations

being crowned with complete success that a still further development is promoted by the great feeling of sympathy in their favor.

That these dairies obtain a large amount of butter from their milk, and that they are in a position to bring this butter direct to the markets and there obtain equally as high prices as for the best butter from the large estates, seems to be the general opinion amongst the small landed proprietors, and that they can obtain better returns for their milk through the medium of these dairies than by any other course of procedure.

The home production of butter amongst the small proprietors is looked upon by them as a hopeless contest against such conditions, partly from the difficulty in producing a first-class quality of butter with their limited supply of milk, and partly from their inability to dispose of their butter at full prices as corresponding with its quality.

Many are of the opinion that much illusion exists with regard to these dairies. These Union Dairies, they urge, have to carry on their operations under very great difficulties, and this is especially the case in the thinly-populated districts of Jutland, where the milk has to be collected from the widely-spread farms over a large area.

These difficulties with which the Union Dairies have to contend, they maintain, are too much underrated by the public, just as much as the difficulties attending home production are overestimated, and it thus remains an open question how far this feverish hurry which has been displayed in the erection of so many new Union Dairies, year after year, before actual necessity has allowed sufficient time for ample tests of experience, is really matter of congratulation for the interests of Denmark's important branch of dairy drift.

Few proprietors of large dairies will be ready to admit that it is so easy a matter to produce butter of the finest quality, and at the same time always to obtain the highest prices of the first-class article. On the contrary, they are too often accustomed to receive complaints from their customers over the slightest falling off in the fineness of their butter, and that it is only with the aid of a good dairy staff and by constantly being on the alert that these complaints can be prevented and all errors redressed. The attention of these large dairy proprietors is continually directed towards the proper feeding of the cows and carefully watching that the fodder mixtures are good and appropriate; that the milk from such cows as are not in a normal condition is carefully set aside for separate treatment lest it should be injurious to the other milk, or even a doubt be entertained thereof. After dwelling on this phase of the subject the question must naturally arise, in what way do the Union Dairies, which receive the milk from fifty or sixty different places without having any knowledge or control over the cows' foddering or their general condition, contrive to carry on their operations successfully? Furthermore, whilst the large dairy owners have always considered as a main point for the production of fine butter that the milk should be conveyed as quickly as possible after milking to the dairy for cooling, and whilst it has always been regarded of absolute necessity that the milk should be removed from the stables at least twice during the milking, so that it may at once be strained and cooled before losing any of its freshness, or injured by any acid formation or from the action of warm and impure air—how, then, it is asked, do the Union Dairies manage to counteract these evils with the evening's milk, which has been allowed to lay over night at the supplying farm, from which it is brought together with the next morning's milk? They thus strongly question if butter of first quality can be produced under these circumstances.

In support of these views it is stated that at the exhibition lately held here over dairy products, out of fourteen exhibits sent in from the Union Dairies, the position of first-class butter was not awarded to them in any single case, and it must not be supposed that this was due to want of proper management in the dairies, as it is fully acknowledged that these are conducted with a very able staff of managers and assistants, but must rather be attributed to the difficulties which they have to contend with, which the ablest of dairy farmers is unable to overcome entirely. With the Union Dairies it is not simply a question of slight errors, but rather an unfavorable character throughout, which in part is displayed in the shape of an unpleasant taste and an unsatisfactory quality, with such peculiar outer appearance that it does not bear the least resemblance to the finest quality of butter from manorial estates.

This pervading unpleasant taste and peculiar outer character, which are characteristics of the butter from the Union Dairies, leaves no doubt but that the same defects and difficulties are common to all of them.

For the production of fine butter good and properly treated milk is first of all the main requisite. Whether the milk used in these dairies possesses these requirements it is difficult to say, and perhaps the managers themselves are not certain on that score, as, practically speaking, it is received by them without the least control or knowledge of its nature. But if these dairies are not supported in this respect by the furnishers in the most conscientious manner, then the discontinuance of their work will undoubtedly only be a question of time. In brisk times of trade, it would appear that difficulty is often found by them in disposing of their produce as first-class quality, and that the prices obtained vary between those of first and second class, and that in dull seasons the sales are attended with considerable difficulty; and as before stated in same degree as these difficulties have been underrated, so have the difficulties attending the home production been overestimated.

It is maintained that no difficulty need exist for the production of fine butter by the small proprietors, as no later than some six or seven years back the produce of these small owners stood at such a high standard that they could display a large exhibition of butter in jars and half firkins, to which nearly half of the exhibits were awarded prizes.

The want of Union Dairies was not then felt, and it is doubtful if at that time these small producers would have been satisfied with the prices they now receive for their milk from the union dairies. In those days there existed in all the towns a numerous class of butter-packing dealers, who purchased this jar butter for subsequent sorting and repacking. With the introduction of the Union Dairies these dealers have all nearly disappeared, for the simple reason that too small a quantity of faultless butter from these small farmers is now brought to hand to admit of any similar repacking with advantageous results. Complaints were frequent, however, on the part of the small producers that when they did supply these dealers with butter in jars of best standard quality, and which was subsequently resold by these dealers at the prices of first-class butter, that they nevertheless had only received at their hands the price of second class; and that they could not be satisfied that the dealer should thus be reaping an advantage of 2½ to 3 cents on every pound of butter, simply because it was delivered in jars.

The producer should, however, bear in mind that where he disposed of his butter in jars at the price of second class that he was obtaining a net price therefor, whilst the dealer who again resold to the trade at first-class prices had to submit to several drawbacks and charges, such

shrinkage in weight, cost of transport, &c., which may fairly be estimated at 5 to 6 per cent.; so that the complaints on this score were more imaginary than real.

The results from these divergent views would appear on the one hand to advise caution on the part of the public in the too hasty erection of new Union Dairies before sufficient knowledge and experience has been acquired, and not to allow themselves to be too blindly led by prejudiced statements and calculations. It should be remembered that whilst it is fully admitted that these dairies have been under the supervision of a very able and skilled staff of managers and assistants, that nevertheless their productions so far can scarcely be said to have been instrumental in any way towards raising Danish butter to that high standard of reputation which it at present holds in the foreign, more especially the English, markets; and it need not either be feared that any advantages or good which these dairies under various conditions have been able to effect will be lost or injured by giving ample time for a proper and minute consideration of their system of operations, and at the same time the small producers should be taught that before this thorough investigation has taken place, they should not put too implicit confidence in the public opinion that these dairies are their only hope. They should remember that in former days they were fully able to furnish a high class standard of butter, and that they then went to their work with pleasure. If they will again devote the same zeal they will again realize the fact that it does not call for a much greater amount of labor to produce a good quality of butter than it does to make an inferior article; it only requires more steady attention and judgment. They must not either place too great weight on the general complaint that they do not obtain full value for their produce when they are forced to sell first-class butter in jars for prices paid for a second-class article, as that complaint is without any real foundation. It is hardly to be imagined that the producer who can obtain the needful assurance of making good butter, and can dispose of it at the price of second-class quality, will not find it more to his interests so to act, rather than to content himself with the sale of his milk to the Union Dairies.

Of this, however, every one must be left to judge for himself; but if these small proprietors remain of the opinion that the Union Dairies are so advantageous to them, then at least there must be such earnestness in their relations to each other that by careful attention to the foddering of their cows and by treating them in every way with the same care and supervision as if they themselves intended to use the milk, as well as by proper attention to speedy straining and cooling, so that they will at all times be in a position to deliver their milk supplies in perfectly sound condition. If the Union Dairies cannot place full reliance on such active support from the producers, their position will be hopeless, as it need not require a prophet to foretell that when they pay 1 cent for the milk and only get back three-fourths of a cent in the shape of butter, no great length of time must elapse before they will be forced to bring their works to a close, and all concerned will be of one mind, that in such case it will be a day of bitter disappointment when the small producers find themselves again compelled to make use of the milk for home production after having arranged their operations on such footing as to be free from the work and when they have also entirely got out of the required habit and practice.

HENRY B. RYDER,
Consul.

UNITED STATES CONSULATE,
Copenhagen, August 25, 1885.

HOLLAND.

DUTCH CATTLE.

REPORT BY CONSUL ECKSTEIN, OF AMSTERDAM.

HUNTING UP CATTLE STATISTICS IN HOLLAND.

In compliance with the instructions contained in the Department circular of the 18th of July last, and in the memoranda accompanying the same, received by me on the 4th of October, I have the honor herewith to return a series of forms such as sent with the said circular, being filled out and containing as much and as authentic information as obtainable, and further to report on the subject as follows, viz:

Observing that the matter at issue is regarded to be of great importance to the agricultural interests of the United States, and that the Department desires and expects that in investigating the same it be so exhausted as to leave as little as possible to surmise or speculation, I have to express my regrets that in performing the task assigned to me I found myself so utterly unaided by any practical experience in farming, stock-raising, and dairying, and my own knowledge of those pursuits so limited and superficial.

Realizing my shortcomings in these respects, it became the more necessary that I should make, as I did, the greater efforts to secure information, data, and material of such persons as are generally held to be amongst the best authorities on the subject in this country.

Strange as it may seem, it is nevertheless true that here in Amsterdam I could obtain no information or be in any way facilitated in the premises beyond ascertaining the names and places of residence of certain parties to whom to apply for attaining my object.

Amongst others I was directed to Mr. J. P. Amersfoord as one of the persons most widely known for possessing an intimate knowledge of and having much practical and diversified experience in affairs pertaining to farming and stock-breeding, &c.

He is the owner and proprietor of one of the finest estates in this country, and of a country-seat, named "Badhoeve," situated near the little town of Sloten, on the turnpike between Amsterdam and Haarlem, about an hour's drive from this city.

There I called upon him, explained to him the object of my visit, and received from him courteous offers of such assistance as it was possible for him to render me.

I left in his hands a copy of the forms and of the memorandum, a few of which I had previously printed, to be left with the parties whom I expected to ask for, and, if possible, receive the required information, data, or statistics for this report.

Mr. Amersfoord prepared, and, several weeks thereafter, furnished me the filled up forms herewith inclosed.

I send them just as received from him, believing that any attempt on my part to sift and transcribe the information they contain might have impaired the value thereof, and that on coming into the hands of some

person fully understanding the subject, as it doubtless will, it can be made available to better advantage.

As I could not be anyways sure, however, to what extent and at what time Mr. Amersfoord would serve me, I considered it necessary to apply in still other quarters for the indispensable data and statistics.

With this object in view I went to Wageningen, there to confer with Jongkindt Coning, esq., the director of the state agricultural school, and, also, to Beverwyk, to meet G. J. Hengevald, esq., who for a great many years was a teacher in the Government veterinary school, at Utrecht, and who is the author of one of the best and latest published works in this country on "Cattle, its different sorts, breeds, and improvement."

Mr. Coning being seriously ill at time of my visit kindly sent for one of his assistants for me to confer with, and with him, as in the case of Mr. Amersfoord, I left copies of the forms and memoranda, after receiving his assurance that he would fill out the forms for me should he find it practicable to do so, and give me any other information that he could.

The result of my visit to Mr. Hengeveld was substantially the same.

After waiting about six weeks I received from the parties mentioned certain data and statistics. The forms, however, they did not fill out.

The assistant director of the state agricultural school, in writing to me, explains his reasons for returning the forms in blank, in substance, about as follows:

Matters relating to the live-stock interests of the Netherlands are of too vital importance permit of answering such radical and interesting questions as are indicated or involved in or by most of the headings of the forms desired to be filled out otherwise than in the most correct way.

With the data at present on hand for this purpose it would be impossible to do this. In such manner as, with great difficulty, he could now answer those questions, he would not want to be responsible for their correctness.

He would not say, however, that it was impossible to fill up the lists so as to convey perfectly authentic and trustworthy information, but to do so would require previous investigation and research for at least two years, and cause a large expenditure.

NAMES AND DISTRIBUTION OF CATTLE BREEDS IN HOLLAND.

In now proceeding to answer the questions contained in the memorandum accompanying the cattle circular of July 18, 1883, I begin by giving a statement showing the several breeds of cattle in this country, and where located, and in giving their names confine myself to the designations given them by the assistant director of the state agricultural school, from whom I obtained my information on this point, as follows:

Groninger breed.—This breed is found principally in the province of that name, and, also, in considerable quantities in Northern and Southern Holland.

Frisian or Friesland breed.—Outside of the province of Friesland this breed of cattle exists in large numbers in the province of Drenthe, where the conditions for raising it are said to be particularly favorable.

Holland or Hollandish breed.—This breed is found in a pure state in the environs of "De Beemster" and "De Purmer," being appellations for certain districts in the province of North Holland, formerly embracing the long-since drained lakes so named. It is supposed here that the Shorthorns of England descend from this breed.

Flemish or Zeeland breed.—Centuries ago this breed was extensively raised in nearly all parts of Holland, but exists now only in Zeeland and on the islands of Southern Holland. The perfect type of this breed is preserved in the well known picture of "Potter."

Geldrian breed.—Most of the cattle found on alluvial soil are said to belong to this breed, but its perfect type is best preserved in the southern part of the province of Gelderland.

Drentish breed.—This breed, in a pure state, is found in the province of Overyssel. It is represented to me that best blooded well fed Drentish cows can hardly be distinguished from "Ayrshires" of Scotland.

Friesland-Drenthish-Geldrian breed.—This cross-breed is found in the provinces of Overyssel and Groninger in addition to the provinces whose names it bears.

Groninger-Friesland-Geldrian breed.—This cross-breed exists in the province of Utrecht, in Northern and Southern Holland, and on the south of the "Y," and, of course, in the provinces after which it is named. It has been extensively substituted in parts of this country where pulmonary diseases had decimated the stock, and where the introduction of, or replacement by, other and different breeds became necessary.

Flemish-Geldrian-Holland breed.—This is a cross-breed of cattle found principally, in Northern Brabant, and in Limburg.

Native and English breeds.—The only province in which cross-breeds of native and foreign (English) origin exist to any extent, is Zeeland. This was formerly, also, more or less the case in Groningen, but the practice of raising this sort of stock there has been abandoned.

MISNAMING DUTCH CATTLE IN THE UNITED STATES.

In this connection it may be proper that I should allude to the fact that in the United States there prevails a practice of writing and speaking of certain or all breeds of Dutch cattle as "Holsteins." So doing seems to be very annoying to farmers, stock-raisers, and to other parties in this country, as there exists no breed of cattle and never did, as I am informed in Holland, named "Holsteins."

If notice would be taken of this matter, and the practice referred to discontinued, it would be greatly appreciated by a large number of people here.

PERCENTAGE OF THE SEVERAL BREEDS IN HOLLAND.

The following statement shows the percentage of each of the several breeds of cattle in the Netherlands, viz:

Denomination of breeds.	Percentage.	Denomination of breeds.	Percentage.
Groninger breed	7	Flemish-Geldrian-Holland breed	15.5
Friesland breed	18.2	Groninger-Friesland-Geldrian breed	23.8
Holland or Hollandish breed	7.1	Crossed with foreign breed, hardly to be recognized	2.5
Flemish or Zeeland breed	3.8		
Geldrian breed	7.1	Total	100
Drenthish breed	1.4		
Friesland-Drenthish-Geldrian breed	13.6		

IMPROVEMENT OF BREEDS BY TRANSFERENCE TO FOREIGN HOMES.

As to foreign and imported breeds producing in their new homes offspring superior to that produced by the same breed in their original homes, and that this superiority is more marked in the succeeding than in the first generation, it is contrary to and not borne out by the experience of farmers and cattle-breeders in this country.

The possibility of such results being attainable is not gainsaid or questioned here, but it is held that to attain such results requires the existence of various and most favorable conditions, which, in certain parts of the United States or in other countries, may obtain, but they do not seem to obtain in this country, or if they do they have as yet not been discovered

Efforts have been made, time and again, in different sections of Holland, by many of the most practical and experienced farmers and stock-breeders, to improve still further, if possible, native breeds by crossing them with best breeds brought in from England and elsewhere, and so has inbreeding of such best imported breeds been tried quite as often and by many parties in many places, but with almost the invariable result in both cases of finding in the offspring certain deterioration or degeneracy, so that inbreeding of such imported stock as a practice is abandoned, whilst experiment, from time to time, has not wholly ceased.

It must not be understood, however, and as is explained to me, that the offspring of such imported breeds showed inferiority in all particulars; on the contrary in many cases the offspring of such foreign breeds showed superiority in one or in another respect as compared with same breeds in their original homes, but, as a rule, they proved inferior in more essential particulars, and therefore the importation, breeding, and raising of such foreign cattle, no matter how fine the breed, has generally been unprofitable.

BEST DUTCH CATTLE FOR EXPORT.

With reference to the question as to "the best animals to export," I believe that in stating what Mr. Amersfoord says in relation thereto will be the best answer I can make.

He says, in substance, this:

We who, in this country, may reasonably claim to be thoroughly conversant with this matter, consider and always recommend animals one year old to be the best for export purposes; for milk breeds we recommend the North Holland and Frisian, and for both milk and beef the Groninger, which, in fact, deserves to be called the "Hereford" of Holland, and is generally conceded to be one of the noblest breeds of cattle to be met with anywhere.

PRICES OF DUTCH CATTLE.

Regarding "the purchasing prices of the animals" it is hardly practicable to speak in positive terms.

The prices paid for thoroughbred stock vary so greatly at all times and seem to be contingent upon such a variety of circumstances that it appears to be difficult to determine what really is the regular price or fixed market value at any time.

During the summer last past when cattle of this class commanded,

generally speaking, a much higher price than in the previous year, the prices realized were about as follows, viz:

	Florins.*
Calves, heifers, under one year old	125 to 150
Yearlings	225 300
Cows, from two to three years old	250 450
Cows, over three years	500 600
Bull calves, under one year old	200 350
Bulls, at from one to two years old	350 800

BEST ROUTES OF TRANSPORTATION TO THE UNITED STATES.

Regarding "the best routes of export" I have to remark that that has not been recently and is not at present a matter of choice for Americans requiring transportation for cattle from this country to the United States, as for the last few years they have been obliged to ship the stock they purchased here from ports outside of Holland, and where such freight was accepted or where transportation for cattle could be obtained—usually at Antwerp and at one or more English ports.

It is represented to me, and I am more than disposed to believe, that the best routes for shipping cattle from this country to ours are or would be from the ports of Amsterdam and Rotterdam.

But as the steamers plying between these and American ports are all carrying passengers, and are, therefore, prohibited from taking cattle on board, and as hitherto the cattle exports to the United States have been too unimportant and irregular to induce any steamship company here to make special arrangements for the cattle traffic or carriage, there exists now no opportunity to ship cattle from either of those ports.

COST OF TRANSPORTATION TO THE UNITED STATES.

As to "the cost of exportation and the estimated expenses for attendance and food *en route*," I would offer the following observations:

The cattle of this country found to be best adapted and most desirable for breeding purposes and the improvement of the stock in the United States should be, and usually are, procured in the provinces of Groningen, Friesland, and North Holland.

When bought in Friesland and Groningen it should be on condition of being delivered, by the different farmers of whom obtained, at a given time at the nearest railroad station or at the most convenient and nearest point or place for conveyance by water to Amsterdam or Rotterdam.

The cost of such transportation naturally differs very much and cannot be exactly stated. It is in accordance with or as the number of cattle at any time to be shipped is large or small, and the distance longer or shorter, but it does not amount to very much at any time per head of cattle in cases of large shipments being made.

Cattle purchased in North Holland can conveniently be, and generally are, driven from the farms to Amsterdam or Rotterdam.

The cost of transportation from this port or from Rotterdam to Gravesend, England, is, as near as I can ascertain, about £1 per head for steers, cows, and heifers, and 10*s* per head for calves.

The present freight rates for shipping cattle in considerable numbers

* Florins = 40.2 cents.

from Gravesend to New York are as follows, exclusive of charges for attendance and food *en route*:

	Per head.
Full grown cattle	£6
Yearlings	5
Calves	4

The expense for attendance on cattle *en route* is ordinarily not very much, especially in cases of large shipments, as three or four persons are said to be sufficient to take proper care of a hundred or more head of cattle.

Besides, it would appear that suitable parties, farmers, or farmers' sons can almost alway be found amongst intending emigrants who for a reasonable, small sum of money are willing and pleased to undertake the attendance and care of the cattle, and who in such cases have no passage money to pay, that being included in the freight-charge for the stock.

Food, hay, and straw is usually provided by the owner or shipper of the cattle; the cost varies and cannot be stated precisely, but no extra charge is made for carrying such supplies.

When cattle are shipped via the port of Antwerp they are, as a rule, taken there by rail from Amsterdam or Rotterdam.

The railway freight rates are at present as follows, viz:

Description.	From Amsterdam.	From Rotterdam.
	Francs.	*Francs.*
Two oxen, cows, or heifers	21.57	14.88
One to five calves	21.57	14.88
Six oxen, cows, or heifers	32.38	22.33
Ten calves	32.38	22.33

In chartering a whole car, and if not more than 16 full-grown animals and 20 calves are put in, the charge is 43.14 francs from Amsterdam and 29.76 francs from Rotterdam.

If a larger number of cattle are taken in a car, as is at the option of the shipper, the price for a car is then raised 25 per cent.

The present regular ocean freight rates for shipping cattle from Antwerp to New York or Boston are, as I am informed by Antwerp shipbrokers and agents, as follows (inclusive of food and water):

Cow	£8
Yearling	7
Calf	6

Attendance *en route* 4*s.* per head.

In shipments of 100 to 200 head at a time better arrangements, they say, can be made.

CATTLE CENSUS OF HOLLAND.

The following tabular statements show the total number of cattle, classified under the separate heads of bulls, milch-cows, calves and heifers, beef cattle, and working oxen, in the different provinces and in the Netherlands from 1866 to 1870; from 1871 to 1880, and in 1881 and 1882, viz:

Years.	Groningen.	Friesland.	Drenthe.	Overyssel.	Gelderland.	Utrecht.	North Holland.	South Holland.	Zeeland.	North Brabant.	Limburg.	Total.
Bulls.												
1866 to 1870	1,753	3,129	332	1,467	1,095	969	1,218	2,498	429	640	555	14,085
1871 to 1880	1,795	3,258	368	1,672	1,434	1,079	1,494	3,005	786	836	607	16,334
1881	1,787	3,083	472	1,762	2,074	1,313	1,538	2,658	975	886	634	17,182
1882	1,596	3,142	475	1,711	1,728	1,190	1,445	2,504	973	873	638	16,275
Milch-cows.												
1866 to 1870	57,194	148,605	39,567	80,669	92,279	54,854	108,647	136,657	27,470	103,014	47,018	895,974
1871 to 1880	51,187	146,255	40,007	83,442	96,342	60,991	109,482	146,564	27,149	102,359	47,463	911,241
1881	43,007	136,798	39,602	81,096	94,920	60,099	110,766	145,139	26,024	99,800	47,663	884,914
1882	42,097	133,647	39,507	81,655	91,882	60,472	111,498	145,050	26,333	99,533	47,282	878,956
Calves and heifers.												
1866 to 1870	33,655	48,497	22,602	33,537	64,457	17,119	26,950	43,179	22,715	58,258	18,054	389,023
1871 to 1880	37,252	54,905	24,877	36,906	71,790	21,170	30,976	49,372	25,939	61,333	20,105	434,625
1881	40,541	60,942	24,312	38,952	72,165	22,622	31,725	54,348	27,671	63,019	20,270	456,567
1882	39,939	62,541	25,077	39,636	73,026	22,935	32,269	52,522	27,300	61,753	20,106	457,104
Beef cattle.												
1866 to 1870	7,046	4,787	756	2,823	11,837	816	3,639	11,470	3,305	9,668	1,063	57,210
1871 to 1880	7,571	4,075	1,173	3,024	13,226	974	4,744	12,641	4,584	9,529	1,935	63,476
1881	8,069	4,559	1,325	2,887	13,121	1,633	4,971	12,887	4,934	10,325	1,813	66,524
1882	7,210	5,010	1,207	2,731	12,722	1,401	5,463	13,083	5,385	10,326	2,101	66,709
Working oxen.												
1866 to 1870	.....	2	25	1,261	1,774	41	3	8	133	4,649	2,590	10,486
1871 to 1880	40	2	30	1,325	1,847	21	.....	2	71	4,215	2,487	10,040
1881	115	3	28	1,152	1,713	1	.....	.....	59	3,810	2,338	9,219
1882	41	2	14	1,125	1,553	42	.....	.....	111	3,674	2,330	8,892

The statement next following shows the total number of cattle of every description in each of the provinces and in the Netherlands from 1851 to 1860; from 1861 to 1870; from 1871 to 1880; and in 1881 and 1882:

Provinces.	1851 to 1860.	1861 to 1870.	1871 to 1880.	1881.	1882.
Groningen	101,406	102,483	97,845	93,519	90,883
Friesland	180,284	202,534	208,495	205,385	204,412
Drenthe	54,762	62,988	66,455	65,739	66,280
Overyssel	108,400	117,612	126,869	125,849	126,858
Gelderland	157,104	171,422	184,639	183,903	180,911
Utrecht	72,931	75,997	84,235	85,668	86,049
North Holland	141,043	141,515	146,696	149,000	150,675
South Holland	179,011	192,218	211,584	215,063	213,159
Zeeland	47,564	53,284	58,529	59,663	60,102
North Brabant	150,576	171,185	178,272	177,840	176,189
Limburg	58,760	65,611	72,597	72,718	72,457
Total	1,260,841	1,358,249	1,435,716	1,434,496	1,427,926

DECREASE IN THE CATTLE OF HOLLAND.

The agricultural report of the Netherlands covering the year 1881, and which has only recently been published, shows that the cold and rough weather in the months of April and May of that year was extremely damaging to the pasture lands, and that farmers who already had their stock out in pasture were compelled to house them again or turn them into their meadows or hay fields.

It was not until June that the growth of grass began to revive, and the prospect for a good hay year seemed better.

Still the first cut of hay turned out but a very indifferent product both as to quantity and quality, whereas the second mowing, owing to almost constantly prevailing rains, resulted far more disastrous and yielded in many places hardly any hay crop at all.

In consequence thereof it was found that at the end of the year 1881 the stock of cattle in the country had decreased by over 35,000 head as compared with same period of 1880.

A further decrease in the number of cattle is now reported as having occurred in 1882, amounting to about 6,500 head; caused by the scarcity of fodder, grass, clover, hay, and straw during the winter of 1881–'82.

But as the last and the current years proved both to be far more favorable grass years and yielded abundant hay crops, the decrease of about 4,100 head in 1881 and in 1882 will, most likely, soon be made up for again, if that is not the case already.

STOCK RECUPERATIVE POWER OF HOLLAND.

A temporary decline in the numerical condition of the stock of cattle occasions in this country no particular uneasiness, as it is generally and well understood that the country's recuperative powers in this respect are very great, and that under anyways favorable circumstances its efficacy for stock-raising is prodigious.

As an illustration hereof the following is stated: In 1866 the stock of cattle, in consequence of the cattle-plague, had been reduced to 1,302,600 head, and in 1867 there were again 1,361,300 cattle in the country, and in 1870, 1,410,800; thus in the comparatively short space of time (four years), the increase amounted to 108,200 heads.

So has it happened in 1864 and in 1871, that on account of the scarcity of grass, clover, hay, and straw the stock showed a shrinkage of 45,300 head in the former and of 34,800 head in the latter year as against the previous years respectively, but it was in both cases replenished in the course of but few years.

From facts and figures above stated may, in a measure, be deduced that the stock of this country is more than sufficient for home demands, and that such is actually the case will be further realized by a glance at the figures given below, and representing the exports of cattle from this country during the last five years and during the nine months of the current year, viz:

Exports of Dutch cattle.

Years.	Number of cattle.	Years.	Number of cattle.
1878	134,711	1881	144,436
1879	138,130	1882	184,910
1880	144,421	1883 (9 months)	99,955

Of the stock exported two-fifths or thereabouts consisted of calves and heifers (young cattle), and the other three-fifths of beef cattle and milch cows, &c.

The countries to which nearly all the surplus cattle were and are generally shipped, are: Belgium, England, Germany (Prussia), and the United States.

IMPORTS OF LIVE STOCK INTO HOLLAND.

The imports of live stock into Holland are comparatively so trifling as hardly to deserve mention, but as they figure in the customs returns of the country I would state that in 1878 they amounted to 4,414 head; in 1879 to 2,837 head; in 1880 to 1,561 head; in 1881 to 275 head; and in 1882 to 1,406 head.

IMPORTS OF AMERICAN CHEESE, BUTTER, AND OLEOMARGARINE.

Whilst it is hardly necessary to say that this country produced more butter and cheese than is required to supply the home demand and that very large quantities are annually exported, I would remark, nevertheless, that the imports and consumption of foreign, especially French and Swiss, cheese are quite considerable.

It is possible that certain kinds of American cheese would, in limited quantities, find a market here if proper efforts to introduce them would be made, which hitherto has not been done.

That enormous quantities of oleomargarine are annually imported into this country, and that the bulk of it comes from the United States, are well known facts.

In my report on this subject of September 12, 1882, I gave the estimated quantity imported during the year ended June 30, 1882, as having been about 80,000 tierces. I am now informed that the transactions in the article have since been most satisfactory, and that the imports of it have still further and greatly increased.

MEAT IMPORTS FROM THE UNITED STATES.

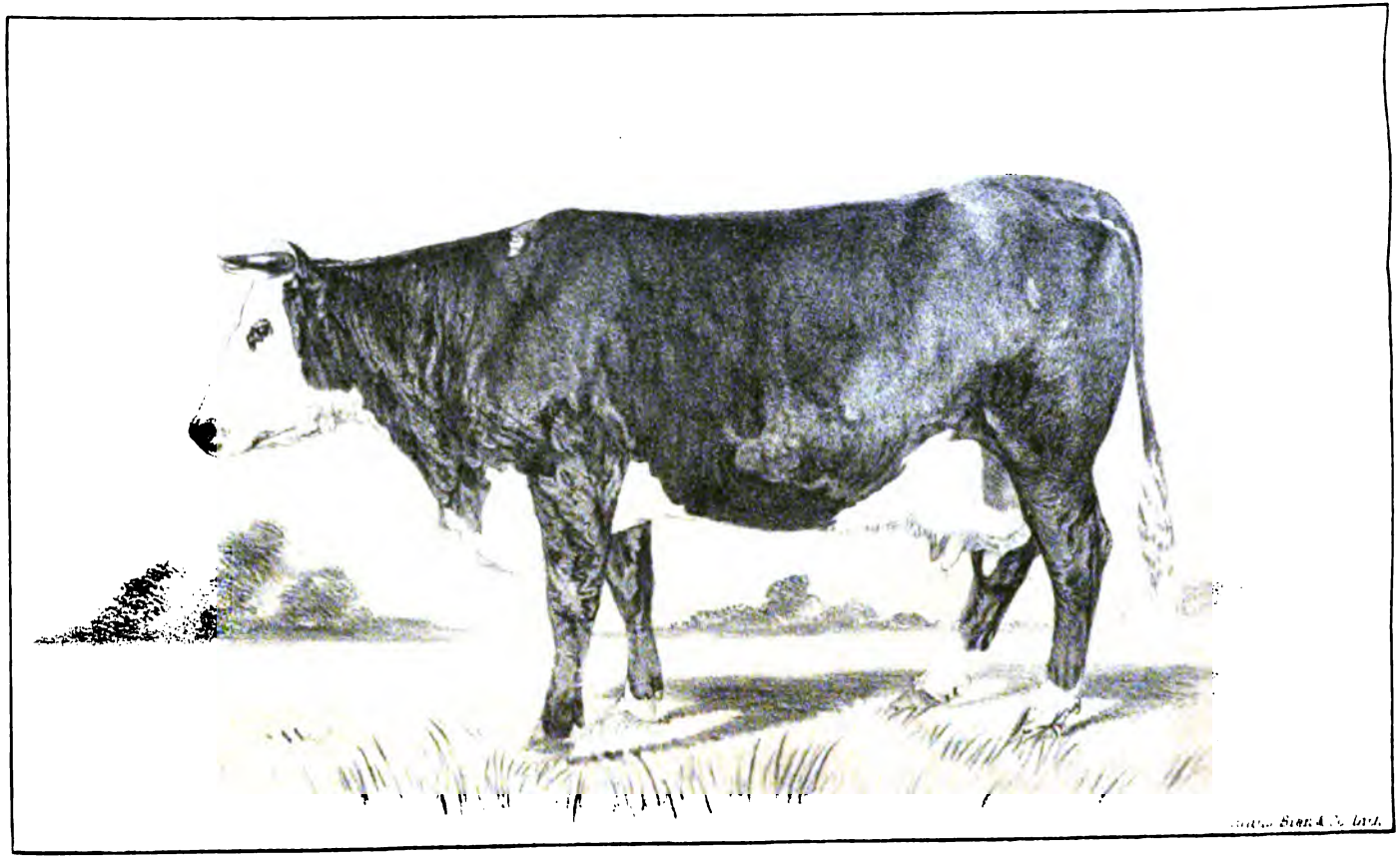
The meat imports from the United States, corned beef, in barrels and cans, and canned beef, tongues, &c., have fallen off very much within the last year or two, but this seems to be owing more to the fact that these articles no longer find their way so generally into the houses and on the tables of the wealthy and well-to-do classes here as was formerly the case than to anything else.

PICTURES OF DUTCH CATTLE.

I inclose two photographs of representative animals, owned by Mr. Amersfoord, the breed, color, and peculiarities of the same being noted thereon.

D. ECKSTEIN,
Consul.

UNITED STATES CONSULATE,
Amsterdam, November 30, 1883.



DUTCH COW WOUTJE

DUTCH MILCH COWS.

Extracts from the milk list kept at the Badhoeve (Bath farm) in the lake of Haarlem, Holland.

[The milk was weighed every Saturday.]

PRODUCT FROM THE COW WOUTJE.

The Woutje was born in May, 1875, and bought when a calf at the market in Leyden, South Holland. The following is her milk record for six years, viz, 1878–'83:

Year.	Milking weeks.	Total yield.
		*Kilos.**
1878 (April to November)	34	2,790
1879 (March to November)	38	3,594
1880 (March to December)	43	4,571
1881 (January to February, July to December)	36	3,428
1882 (January to September)	39	2,527
1883 (February to October)	38	4,441

* Every kilogram of milk may be considered a liter.

*Woutje's calves.**

When born.	Name.	Color.	Name of bull.
April 1, 1878	(337) Bloesje, female	Black; white head and belly	(270) Zegan.
March 3, 1879	(394) Chloris, male	do	(288) Zora.
March 3, 1880	(516) Dahlia, female	do	(327) Aron.
July 5, 1881	(653) Eland, male	do	(394) Chloris.
July 5, 1881	(654) Elders, male	do	Do.
1882	No calf		
February 4, 1883	(841) Geesje, female	Black; white head and belly	(639) Erst.

* Figures in ( ) represent Nos. of animals in Mr. Amerafoordt's herd-book.

PRODUCT FROM COW SUZETTE.

This cow was calved in the Lake of Haarlem March 12, 1871. Nothing further is known of her antecedents than that she came of Dutch breed. The record shows that the Suzette had her first calf February 20, 1874, and her subsequent calves on May 8, 1875; May 14, 1876; May 20, 1877 (no calf in 1878); March 20, 1879. The Suzette was sold, dry, on April 20, 1880.

Milk record for seven years.

Year.	Number of milking weeks.	Total yield.
		Kilos.
1874 (February to December)	45	4,627
1875 (January, May to December)	40	4,802
1876 (January to February, May to December)	42	5,124
1877 (January, April to December)	40	5,271
1878 (January to December)	48	3,980
1879 (April to December)	39	4,578
1880 (January to March)	12	980

Special statistics concerning Dutch cattle.

[Prepared for Consul Eckstein, by Mr. J. P. Amersfoordt, of Badhoeve, near Amsterdam.]

District.	Annual average yield of milk.	Milk to pounds of butter.	Milk to pounds of cheese.	Habitat.	Size of cow at maturity.			Live weight.		
					Length.	Breadth.	Height.	Cow.	Bull.	Ox.
	Liters.				*Meters.*	*Meters.*	*Meters.*	*Kilos.*	*Kilos.*	*Kilos.*
Groningen	4,500	4 to 4½ per cent		Northwest Quarter	2	0.38	1.31	450	350	500
Do	4,000	4 to 5 per cent		Hunzego				325		
Do	3,000			Southwest Quarter	1.92		1.24	300		
Friesland	4,500			Sea-clay polders	2.05		1.38	450		
Do	5,000	Good	Good	Fens						
Drenthe	2,000	4 liters for 1 kilogram of butter		Diluvial sands				250		
North Holland	5,200	Butter 4 per cent	Cheese 6 per cent.	Polders, Geest, Fens	2.20	0.58	1.47	450		
South Holland	4,500	4 per cent	Cheese 6 per cent	All sorts of alluvial soils				450		
Zeeland	2,500			Islands	2.20	0.58	1.44	400		
North Brabant	2,000			Sandy heath lands						

District.	Age at maturity.	Weight of meat at maturity.	Color.	Desciption of.	How long bred pure.	Origin of breed.	Product.		
							Meat.	Milk.	Cheese.
	Years.	*Kilos.*							
Groningen	5	450	Black, white nose, head, and belly, black nostrils.	Fine head and limbs, neat horns, fine tail.	Several centuries.	Aboriginal	Meat	Milk	Cheese.
Do	5	350	Black, white head	Very hardy	do	do	do		
Do	4 to 5	300	Spotted, black and white	Smaller	do	do	do	Milk	
Friesland	4 to 5	450	Spotted, white and black	Large	A° 1550	Environing districts	do	Milk	Butter.
Do	4 to 5	450	do	Smaller, lighter	Several centuries.	Aboriginal	do	Milk	Cheese.
Drenthe									
North Holland	4 to 5	400 to 500	White, spotted with black	Large breed	Mostly Frisian breed.	The aboriginal a very good breed.	do	Milk	Cheese.
South Holland	5 to 6		White, black, spotted, and all other colors; very large breeds, and also smaller; weight different according to soil.	All sorts of breeds	Mixed breed	All parts of the Netherlands.	do	Milk	Butter and cheese.
Zeeland	5	450	Black, white backs	A rough breed, severe climate.	Aboriginal	At least since five centuries.	do	Milk	
North Brabant	4	250	All colors	Small, not fat	Mixed	The neighboring country.	do		

Topography.

Districts.	Altitude.	Mean temperature.	Summer, July.	Winter, December.	Soil.			
					Alluvial.	Loam.	Clay.	Sandy, &c.
		° *Cent.*	° *Cent.*	° *Cent.*				
Groningen; Groningen	AP*	9.88	18.06	2.47	North, sea clay; south, diluvial sand, high turf moors.		Marine clay	Diluvial sands.
Friesland; Leemardon	AP	9.64	18.32	2.66	North, alluvial sea clay.			South, peat.
Drenthe; Assen	AP meter+10	9.56	18.59	2.02			Along the brooks	Diluvial sand.
North Holland; Amsterdam	AP-5m (polders)	9.94	17.76	3.50	Alluvial		In the polders marine clay.	Sand in dunes; low moors, peat.
South Holland; Hellevoetsluis	AP-2m-6m (polders)	10.41	18.86	3.28	Alluvial	Near the Rhine	In the polders marine clay.	Sand in dunes; low moors, peat.
Zeeland; Flushing	AP-2	10.54	18.50	4.20	Alluvial		Marine clay	Sand in dunes.
North Brabant; Maestrocht	AP+30m	11.08	20.12	3.57	Diluvial	Loam		Diluvial and alluvial sand.

*AP signifies the level of the sea at Amsterdam.

Substratum.

Districts.	Limestone.	Sandstone.	Granite.	Clay.	Gravel, &c.	Cultivated grasses.		
						Timothy.	Clover.	Rye-grass, &c.
Groningen		In the hills		Sea clay	From the Rhine	Timothy	Red and white	Rye-grass.
Friesland				Sea clay	do	do	do	Do.
Drenthe			Erratic blocks from the Rhine		do	do	do	Do.
North Holland				Marine clay		do	do	Do.
South Holland				Marine clay		do	do	Do.
Zeeland				Marine clay		do	do	Do.
Limburg	Limestone, coal measures	In the hills	Erratic blocks from the Maas		Maas diluviums	do	do	Do.

Districts.	Methods of housing.	Feeding.	Breeding.
Groningen	Large farm-houses	Hay, straw, mangolds	Breeding country.
Friesland	Large farm-houses	do	Do.
Drenthe	Small farms	Straw, heath, turnips, rye, spurry	Breeding.
North Holland	Covered hay-stacks, cheese-houses, stabling round the wall	Cheese factory	Very few breeding.
South Holland	Movable hayricks, butter cellars, cheese-rooms, stabling in the middle of the house.	Distillery feeding, Schiedam	Very few breeding.
Zeeland	Large farm-sheds for tillage	Feeding	Breeding.
North Brabant	Granaries	Feeding	Breeding.
Limburg	Flemish, small culture	do	Do.

THE CATTLE OF HOLLAND.

REPORT BY CONSUL WINTER, OF ROTTERDAM.

In compliance with circular of July 18, 1883, and its memoranda of August 25, 1883, I have prepared the following report upon the cattle of Holland.

To obtain the necessary information I addressed Mr. C. J. M. Jongkindt Coning, director of the Government agricultural school at Wageningen, and I transmitted to him a copy of the forms annexed to the cattle circular. In his reply he intimated, however, that the filling out of those forms was impossible to him, as such would require a special study.

I have, however, succeeded in obtaining the following information, for the greater part of which I am indebted to the above-named gentleman, and the balance was obtained from official and reliable sources.

THE DIFFERENT BREEDS IN HOLLAND.

The different breeds and their percentage in the Dutch stock are as follows:

	Per cent.
Groningen breed	7.02
Frisian breed *	18.15
Holland breed	7.08
Flemish or Zeeland breed	3.83
Gelderland breed	7.08
Drenthe breed	1.42
Frisian-Drenthe-Gelderland breed	13.61
Groningen-Frisian-Gelderland breed	23.81
Flemish-Gelderland-Holland breed	15.52
Miscellaneous breeds	2.48

The Frisian breed is considered as very good breeding cattle, and is principally found in the provinces of Friesland and Drenthe.

The Holland breed is principally found in the Purmer and the Beemster, in the province of North Holland. This is probably the breed from which the Shorthorns have been raised in England, although it is still doubtful whether the Flemish cattle must not be considered as the primitive breed of the Shorthorns.

The Drenthe breed is so much like the Ayrshire breed of Scotland that it is nearly impossible to distinguish a thoroughbred Drenthe cow from an Ayrshire cow. The best animals of this breed are found in Salland, province of Overyssel.

The Flemish or Zeeland breed was found all over the Netherlands about two centuries ago, and the type of it has been preserved in the celebrated painting of "Potter's bull." In present times it is only found in the province of Zeeland and the southern parts of South Holland.

The following statements are herewith transmitted:

A.—Number of bulls, milch cows, calves, and heifers, fat cattle and oxen in each province and in the whole country of the Netherlands during 1881, and the average number of the last ten years.

B.—Increase or decrease of cattle in 1881, as compared with 1880.

The decrease of about 35,300 head of cattle in 1881 was principally caused by the bad harvest of grass and hay in 1881.

C.—Total numbers of cattle during the last twenty years.

* So-called Holstein cattle.

PRICE OF DUTCH CATTLE.

The average prices of cattle in the principal markets of the Netherlands during the last five years were as follows:

Cattle.	1878.	1879.	1880.	1881.	1882.
Amsterdam:	*Florins.*	*Florins.*	*Florins.*	*Florins.*	*Florins.*
Fat cattle	280	285	270	250	260
Milch cows	260	270	250	220	240
Grass calves	45	36	36	36	36
Young calves	9	9	8	8	10
Leeuwarden:					
Fat cattle	305	275	280	305	225
Milch cows	235	230	200	190	211
Grass calves	64	42	50	30	54
Fat calves	58	51	50	39	42
Young calves	750	8	7	7	5
Groningen:					
Fat cattle	245	200	225	250	200
Milch cows	.....	.....	.....	.....	250
Ordinary cattle	165	150	160	150	185
Rotterdam:					
Oxen	290	270	275	275	250
Cows	250	230	225	220	220
Calves	55	60	62	60	70
Young calves	12	10	10	10	10
Zwolle:					
Bulls	.....	.....	205	.....	.....
Milch cows	.....	.....	280	200	.....
Calves	.....	.....	48	35	.....

CATTLE IMPORT AND EXPORT OF HOLLAND.

The following statement shows the number of cattle imported into and exported from the Netherlands during the last five years:

Year.	Import.	Export.
1882	1,406	154,916
1881	275	144,436
1880	1,561	144,421
1879	2,697	138,130
1878	4,414	134,711

In 1882 1,152 head of cattle were imported from Germany and 228 from Belgium; of the total number of cattle exported in 1882, 64,060 were exported to Belgium, 44,586 to England, 45,816 to Germany, and 351 to the United States.

EXPORT OF DUTCH CATTLE TO THE UNITED STATES.

The best methods of exportation of breeding cattle to the United States are via London or via Antwerp.

The best animals of the Dutch cattle for exportation for breeding purposes are those of the Holland and Frisian breeds. The prices are 800 to 900 florins* for bulls, 250 to 400 florins for cows, 200 to 250 florins for heifers, and 120 to 150 florins for calves. The through rates from Rotterdam to New York or Boston vary from £4 to £5 for a calf; from £5

* Florin = 40.2 cents American.

to £6 for a heifer; and from £6 to £7 10*s*. for a cow or bull, and in addition 10 per cent. primage and sufficient fodder for twenty days.

The average price of hay is $20 per ton, and of straw from $12 to $14 per ton.

JOHN F. WINTER,
Consul.

UNITED STATES CONSULATE,
Rotterdam, December 27, 1883.

A.—*Number of cattle in the Netherlands.*

Provinces.	Bulls.		Milch cows.		Calves and heifers.		Fat cattle.		Oxen.	
	1871–'80.	1881.	1871–'80.	1881.	1871–'80.	1881.	1871–'80.	1881.	1871–'80.	1881.
Groningen	1,795	1,787	51,187	49,007	37,252	40,541	7,571	8,089	40	115
Friesland	3,239	3,083	446,255	136,798	54,905	60,942	4,075	4,559	2	3
Drenthe	368	472	40,007	39,602	24,877	24,312	1,173	1,325	30	28
Overyssel	1,672	1,762	83,442	81,096	36,906	38,952	2,024	2,337	1,325	1,152
Gelderland	1,434	2,074	96,342	94,920	71,790	72,165	13,226	13,121	1,847	1,713
Utrecht	1,079	1,313	60,991	60,099	21,170	22,622	974	1,033	21	1
North Holland	1,494	1,538	109,482	110,766	30,976	31,725	4,744	4,971	.....	.....
South Holland	3,605	2,658	146,564	145,139	49,372	54,348	12,641	12,887	2	.....
Zeeland	786	975	27,149	26,024	25,989	27,671	4,584	4,934	71	59
North Brabant	836	896	102,359	99,800	61,332	63,019	9,529	10,325	4,215	3,810
Limburg	607	634	47,463	47,663	20,105	20,270	1,935	1,813	2,487	2,338
Total	16,334	17,182	911,241	884,914	434,625	456,567	62,476	66,534	10,040	9,219

Provinces.	Total.			
	1851–'60.	1861–'70.	1871–'80.	1881.
Groningen	101,406	102,433	97,845	98,519
Friesland	189,284	202,534	208,495	205,385
Drenthe	54,762	62,988	66,455	65,739
Overyssel	108,400	117,612	126,369	125,349
Gelderland	157,104	171,422	184,639	183,993
Utrecht	72,931	75,997	84,225	85,033
North Holland	141,043	141,515	146,696	149,999
South Holland	179,011	192,218	211,584	215,032
Zeeland	47,564	53,684	58,529	59,663
North Brabant	150,576	171,185	178,272	177,940
Limburg	58,760	65,611	72,597	72,718
Total	1,260,841	1,358,249	1,435,716	1,434,406

B.—*The increase* (+) *or decrease* (−) *of cattle in* 1881 *against* 1880.

Provinces.	Bulls.	Milch cows.	Calves and heifers.	Fat cattle.	Oxen.	Total.
Groningen	+ 30	− 865	− 187	+ 44	−166	− 1,144
Friesland	−153	− 4,737	−2,176	+ 426	− 1	− 6,641
Drenthe	+ 36	− 1,630	−2,328	+ 135	+ 2	− 3,785
Overyssel	+ 8	− 3,258	−1,420	− 246	− 33	− 4,949
Gelderland	+309	− 1,303	−1,466	−1,100	− 66	− 3,626
Utrecht	+128	− 782	+ 39	+ 445	− 6	− 176
North Holland	−165	− 339	−2,210	− 170	.....	− 2,890
South Holland	−288	− 7,757	+1,286	− 899	− 6	− 7,614
Zeeland	− 3	− 776	+ 4	− 423	+ 8	− 1,190
North Brabant	− 78	− 561	+ 62	− 255	−304	− 1,136
Limburg	−204	− 985	− 684	− 146	−123	− 2,142
Total	−380	−23,093	−9,126	−1,989	−695	−35,293

C.—*Number of cattle in the Netherlands during the last twenty years.*

Years.	Number.	Years.	Number.
1861	1, 335, 300	1872	1, 457, 000
1862	1, 374, 000	1873	1, 432, 100
1863	1, 380, 600	1874	1, 458, 100
1864	1, 334, 800	1875	1, 456, 700
1865	1, 314, 100	1876	1, 439, 200
1866	1, 302, 600	1877	1, 432, 000
1867	1, 361, 300	1878	1, 456, 500
1868	1, 368, 200	1879	1, 461, 500
1869	1, 401, 900	1880	1, 469, 700
1870	1, 410, 800	1881	1, 434, 400
1871	1, 376, 000		

RUSSIA.

CATTLE-BREEDING IN RUSSIA.

REPORT BY CONSUL-GENERAL STANTON, OF ST. PETERSBURG.

LACK OF CATTLE STATISTICS IN RUSSIA.

Referring to the Department's circular of July 18, 1883, I have the honor to transmit herewith a translation of a document forwarded to this office from the Russian department of agriculture.

In the letter accompanying this document the director of the department of agriculture, General Razeffsky, informs me that the minister has just appointed a committee of experts to inquire into the system of cattle-breeding in Russia, both from an economic and technical point of view.

The proceedings of the committee will be published in a separate report and sent in due course to the consulate-general.

This report shall be translated and forwarded to the Department immediately upon its receipt.

I regret that the information supplied by the department of agriculture should be so meager and indefinite, but transmit it, hoping it may contain possibly something of interest.

I am promised full replies for Finland, and still hope to secure further details for Russia.

CATTLE BREEDS IN RUSSIA.

The cattle raised in Russia are principally local breeds and seldom crossed with foreign varieties.

They are mostly small, the height over the shoulder being from 1 meter to 1.15, the minimum being 0.90, the maximum 1.35 meters. The difference in height is due to surrounding conditions.

A great many foreign breeds have been imported for private estates; but up to the present time there are no regular breeding establishments for mixed varieties.

MILKING QUALITIES OF RUSSIAN CATTLE.

Only the Kolmogory cattle, the product of crossing local cattle with Dutch breeds, which exists at the mouth of the Düina, present a regular and settled type.

They are remarkable for their yield of milk, and are the favorite breed in St. Petersburg, where a great number of cows of this breed are brought.

The following table gives some particulars as to the Russian and Kolmogony cows:

Breeds.	Live weight.	Milk producing—		Quantity of milk.	
		1 pound butter.	1 pound cheese.	Average.	Maximum.
	Kilos.	*Pounds.*	*Pounds.*	*Liters.*	*Liters.*
Yaroslaff	240 to 400	25 to 27	8 to 11	1,400 to 1,800	2,400
Vologda and Kostroma	200 320	22 26	8 11	1,200	2,000
Cows in different parts of Tver, Novgorod, and other governments, and on the rivers Oka, Dnieper, &c.	160 220	24 27	8 11	800 2,200	2,400
Kolmogony	.....	27 32	8 11	1,800 2,400	2,800

Some cows give five times their own weight in milk.

The proportion of killed animals to their live weight is generally 3 to 7.

Feeding.—Russian cows are principally grazed. The winter food is very moderate. Hay or straw is the staple food, some little strengthening matter, as from 1 to 5 pounds of flour or bran per head being added.

Color.—The color of the cows is various; but some colors are peculiar to certain parts. In a great many districts, for instance, black cattle, with white heads, bellies, and feet prevail; in others, red prevails instead of black.

Form.—The form, however, is almost the same everywhere. The animals are small, and mostly short-legged. They have an elongated body, a straight or slightly concave back, sloping hind-quarters, and long tail. The udder is not very prominent, but is considerably developed at the upper part and extends forward.

Rearing calves.—The manner of rearing calves is very middling and even careless.

MEAT PRODUCT.

In the southern and eastern provinces cattle are bred as beasts of burden and for their meat.

Varieties.	Meat.	Tallow.
	Kilos.	*Kilos.*
Gray Tcherkasky	400	48
Black Sea	288	32 to 48
Don	320	32 48
Orenburg	224–272	32 48
Simbriak	(?)	(?)
Samara	(?)	(?)

EDGAR STANTON,
Consul-General.

UNITED STATES CONSULATE,
St. Petersburg, December 20, 1883.

ADDENDA TO RUSSIAN CATTLE REPORTS.

In view of the efforts which are being made for the development of the beef product of Russia for export, the following statistics and information, compiled principally from a report by Consul-General Stanton

on the resources of Russia, and published in Consular Reports, No. 51, are given, to supplement the rather meager reports from that country in response to the cattle circular:

AREA AND POPULATION OF THE RUSSIAN EMPIRE.

The Russian Empire has an area of nearly 395,000 geographical miles, or about one-sixth of the land on the globe. From Ararat to Kolo, the southern and northern extremities, there are 700, and from the eastern and western extremities, Eastcape to Kalish, 2,500 geographical miles. The frontiers extend over 6,370 geographical miles, 4,350 miles of which are sea-coast. Unfavorable climate and formation, however, limit this littoral, as far as commerce is concerned, to the relatively small portions of the Baltic, Black, and Japanese Seas.

The Empire is divided naturally into three great districts, viz:

Districts.	Square kilometers.	Inhabitants.
European Russia, with Poland and Finland	5,389,628	85,000,000
Caucasus and trans-Caspian districts	799,755	6,000,000
Siberia and Central Asia	15,512,869	9,000,000
Total	21,702,252	100,000,000

European Russia, with one-fifth of the total area, has nearly six times as many inhabitants as all the other districts together. It is divided generally into two zones, the one embracing all the territory without and the other all that with Blackearth, these two zones being again subdivided into nine groups of governments or provinces.

PROVINCIAL CHARACTERISTICS OF RUSSIA.

For a more comprehensive classification of his subject, Consul-General Stanton, in the report already referred to, has grouped the "governments" as follows:

Northern group.—Archangel, Olonektz, and Vologda. These are the least populous districts of Russia, forests and tundra predominating.

Central group.—St. Petersburg, Novgorod, Tver, Pskoff, Smolensk, Moscow, Kaluga, Vladimir, Yarosloff, Kostroma, Nijni-Novgorod, Viatka, and Perm. Agriculture is successfully carried on in all these governments.

Baltic group.—This group consists of the following provinces: Esthonia, Livonia, and Courland. The average crops in these three provinces is much greater than those of the thirteen governments of the central group. Wheat, rye, barley, buckwheat, oats, and potatoes are principally cultivated, the latter being largely used for distilling purposes. Considerable attention is paid to horse-breeding, there being 375,000 in this group, an increase of 32 per cent. since 1851. Cattle have increased 42 per cent. since 1851. The district possesses about 1,006,000 head. Sheep number 1,047,000, 917,000 of which are native breeds. The increase since 1851 is about 70 per cent. Swine number 360,000, having increased since 1851 33 per cent. Forests have decreased since 1855 45 per cent., and their protection and extension is a question of vital importance. Distilling, brewing, and milling are extensively carried on in this district.

Western group.—This group embraces the six governments of Mohileff, Vitebsk, Vilna, Kovno, Grodno, and Minsk, has an area of 306,476 square kilometers, and a population numbering 6,185,000. Spring and winter wheat, rye, barley, buckwheat, oats, potatoes, and flax are cultivated. Horses numbered in 1876 1,499,000, and receive considerable attention. Cattle numbered 2,519,000; sheep, 2,042,000, 371,000 of which were fine-wooled breeds; swine, 1,570,000; goats, 220,000. Forests have been greatly devastated, and have decreased in area more than 3,000,000 desiatines (over 8,000,000 acres). Distilling, brewing, and sugar-making are carried on extensively in this group.

Vistula group.—This group includes the former Kingdom of Poland. The consul-general was unable to give statistics of any account regarding this group. Notwithstanding its dense population this group is a grain-exporting one. Horses in 1870 numbered 754,000; cattle, 2,232,000; sheep, 4,180,000; swine, 1,104,000, and goats 15,000. Forests have been greatly devastated. Distilling, brewing, and sugar-making are, as adjuncts to agriculture, extensively carried on. Statistics concerning Polish cattle will be found in the report from Consul Rawicz, of Warsaw.

Southwestern Blackearth group.—This group includes the three governments of Kief, Podolia, and Volhynia, and is one of the most favored districts of Russia both as to soil and climate.

Beet roots play an important rôle in this group. About 115,957 desiatines were planted, producing 99,242,650 poods.

In 1871 the horses in this group numbered 866,000, having increased 80 per cent. in twenty years; cattle numbered 1,500,000, having decreased 11 per cent.; sheep, mostly native breeds, 2,420,000; swine, 1,258,000; goats, 85,000.

Southern Steppe group.—This group includes the governments of Bessarabia, Cherson, Yekaterinoslaff, Taurida, and the Don Cossacks district, which are more or less characterized by the word steppe.

The greatest part of the grain production of this group is exported. In 1876 the horses numbered 1,185,000; cattle, 3,427,000; sheep, 13,174,000, of which 7,097,000 were merinos; swine, 787,000; goats, 139,000. But little forest exists, and that little is neglected or wasted, and has decreased 35 per cent. since 1840.

Distilling, brewing, and sugar-making are carried on, though the lack of fuel militates against these industries.

Central Blackearth group.—This group consists of the governments of Toola, Riasan, Orel, Koorsk, Voronesh, Tambroff, Pensa, Karkoff, Poltava, and Tchernigoff. Cereals, fruit, and oleaginous and fibrous plants thrive in this group.

The proportionately small amount of grazing land in this group has its influence on the breeding of domestic animals. Horses number 4,358,000; cattle, 4,137,000; sheep, 10,841,000, 1,537,000 of which are merinos; swine, 3,057,000; goats, 141,100. Forests play an unimportant rôle in this group, and have decreased 20 per cent. Pensa, Tamboff, and Orel have the most, Toola and Poltava the least forest land.

There are in this group 68 sugar-mills, whose annual production is valued at 13,172,000 rubles; 745 distilleries, whose production is valued at 80,355,200 rubles; 70 breweries, producing 1,242,700 rubles beer; 940 oil-mills, producing 2,159,400 rubles oil, and 47 tobacco works, producing 3,304,000 rubles tobacco.

Eastern and Southeastern group.—This group includes the governments of Kasan, Simbirsk, Saratoff, Samara, Oufa, Orenburg, and Astrakan. The soil of this group is fertile, except in Astrakan, where its fruitfulness is affected by the salty character of the earth.

RUSSIAN CATTLE.

Russia possesses more cattle than any other country in Europe, but is surpassed in this respect by both the United States and South America. Of the many native breeds few if any are worthy particular notice. The Cholmogory, originally a cross between Dutch cattle and a native breed of Archangel, is the best known race. It dates from Peter the Great's time, is used for improving other native breeds, and is kept up by constant import of Dutch bulls. The breed is mainly owned by peasants.

With regard to cattle Russia may be divided into three zones, the northern, southern, and southeastern. In the first cattle are kept chiefly for dairy purposes and manure. The breeds kept are native, often crossed with foreign breeds, are small in stature, and not particularly large milkers. The Russian races develop slowly and possess on the average from 7 to 8 poods of coarse, unsavory meat. West Russian and Cholmogorian cattle weigh from 17 to 20 poods.

In the second zone cattle are kept as beasts of burden and for their meat. They are largely exported, and, though poor milkers, are esteemed for their meat and as workers.

In the southeastern zone oriental breeds are kept chiefly for their meat and tallow. They yield less meat than those of the southern zone and are poor milkers.

PICTURES OF RUSSIAN CATTLE.

Under date of December 5, 1884, Consul-General Stanton transmitted to the Department sixty photo-lithographs of Russian cattle, which were supplied by the director of aguriculture in St. Petersburg. These pictures represent cattle in the northern and central groops only and in Finland, viz:

Northern group.—Government of Archangel, four representing cows of the "Cholmogorian" breed and four of unspecified cattle; Government of Vologda, seven cows and seven oxen, evidently of the common breeds of the country.

Central group.—Government of Perm, nine cows, five of which are hornless, and all evidently the common scrub race of the country. Government of Viatka, five cows, fully as inferior as those of Perm, and evidently of the same breed. Government of Kostroma, fifteen cows and three bulls. One of the cows is designated "native cow;" the others are not designated. All are superior looking animals to those of Perm and Viatka. Government of Yarosloff, four cows seemingly the same breed as those of Kostoma.

Finland.—A cow and bull, breed not designated. They would seem, however, to be a cross between the Finnish and Ayrshire cattle, which, according to the report from Helsingfors, would seem to constitute a large portion of the cattle of Finland.

As it would serve no practical purpose to publish the sixty engravings of Russian cattle which accompanied Consul-General Stanton's report, selections are herewith given, which, with the cuts of Polish cattle given with the report by Consul Rawicz, of Warsaw, will, it is thought, fairly represent the breeds of the Empire.

CATTLE IN THE BALTIC PROVINCES.

REPORT BY CONSULAR AGENT BOMBOLDT, OF RIGA.

I have the honor to inclose herewith a report having reference to the breeding of cattle in this consular district, but I regret to say that the information I have been able to collect upon this subject is very limited, as pure bred cattle are very rarely found in these provinces, where stock-raising is in a primitive state. The domestic cattle in their present condition would not be recommendable for export. The only cattle fit for exporting are the Podolian (prairie breed from the south of Russia), which is renowned for its contentedness with regard to food and attention, as also for its large size and excellent quality of meat. The risk of spreading the cattle plague in other countries must be taken into consideration in this connection. By continual and exact experiments in breeding the Podolian cattle in the United States it could be ascertained whether this very useful cattle would not lose its disposition to disease, under the influence of the soil and climate there. These cattle cost here from $40 to $60 per head. In Libau a large slaughtering establishment has been formed this spring with the view of exporting fresh meat to England, and it has its own steamer, fitted with refrigerators, running regularly to London. The cattle, especially Podolian, come from the interior of Russia by rail to Libau.

The best manner of export to the United States would be via England. The cost from Riga to England for cattle varies from about $18 to $20 per head. The stock is increasing and is sufficient for home demand.

PET. BOMBOLDT,
Consular Agent.

UNITED STATES CONSULAR AGENCY,
Riga, November 8, 1883.

Special statistics concerning cattle in the Baltic provinces.

Name of breed.	Annual average product of milk.	Habitat.	Live weight.	
			Cow.	Bull.
	Pounds.		*Pounds.*	*Pounds.*
Angeln	4,900	Russia	850	1,850
Oldenburg	4,800	Baltic provinces	1,040	1,670
Cholmogorian	4,800	Livonia and Curonia	1,000	

Domestic cattle (cross-breeds): Of middle size and mostly small of stature; color, brown and reddish, also gray and white. Age at maturity, three to four years, when their weight is from 540 to 725 pounds. Origin, a cross between foreign and domestic cattle. They are not used for labor. Weight of meat, 290 to 300 pounds. They produce from 276 to 324 gallons of milk yearly. Product of cheese not known.

Topography: Altitude, 90 feet; temperature, summer, 66° F.; winter, 13° F.; soil, alluvial and sand, with some loam; substratum, clay.

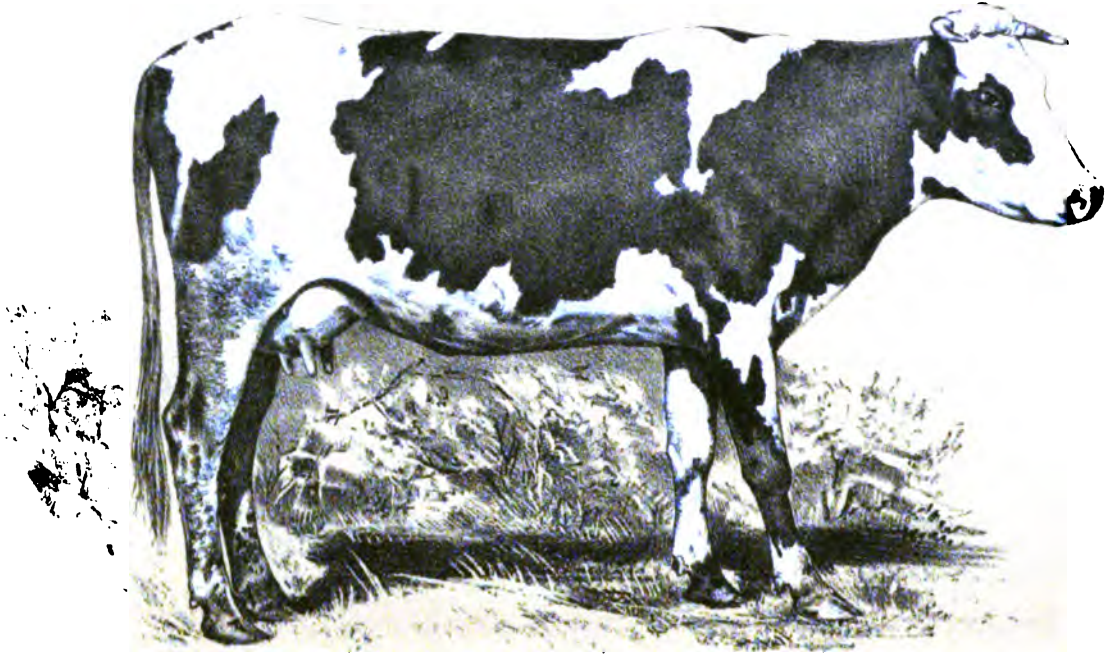
Cultivated grasses: Timothy, clover, and rye grass.

Housing: In stables, on the dung mixed with straw and left there until spring.

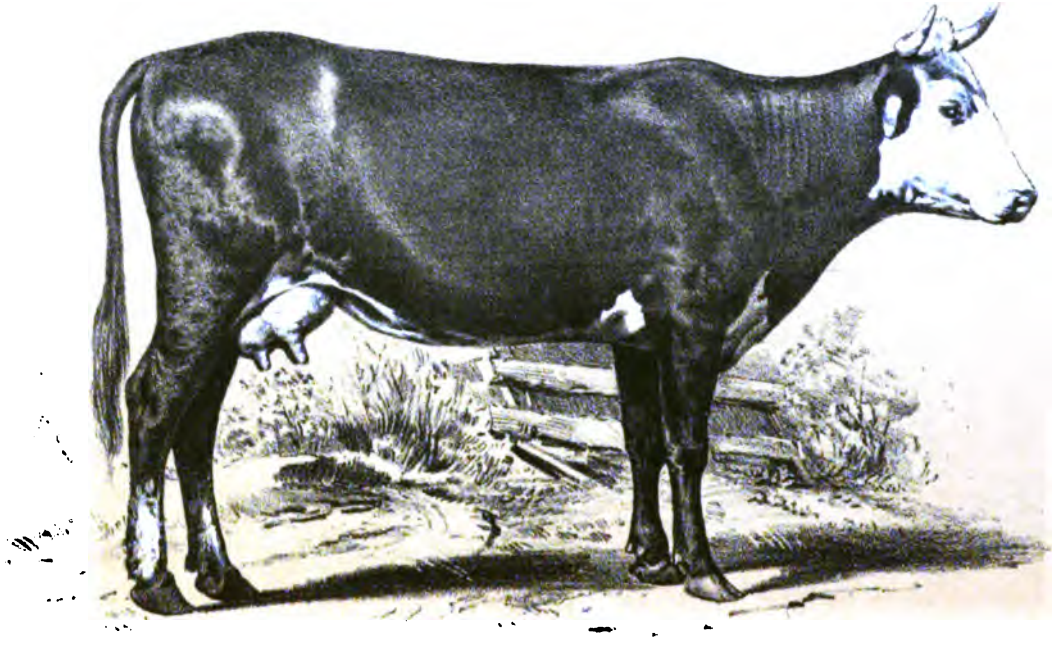
Feeding: In winter, hay, straw, bran; in summer, pasture.

Breeding: Angeln, Oldenburg, Cholmogoren, country, and cross-breeds.

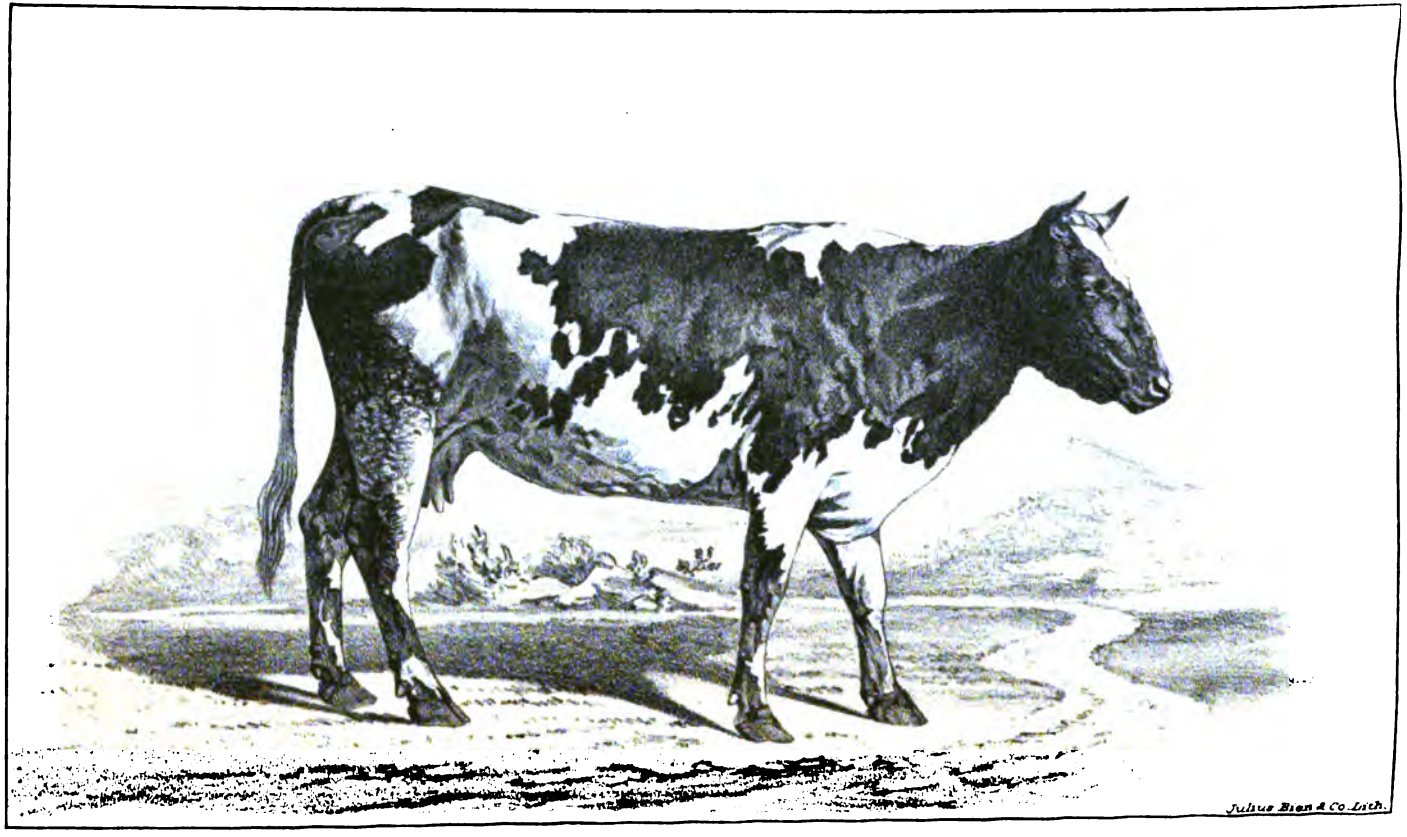
Products: Milk and cheese.



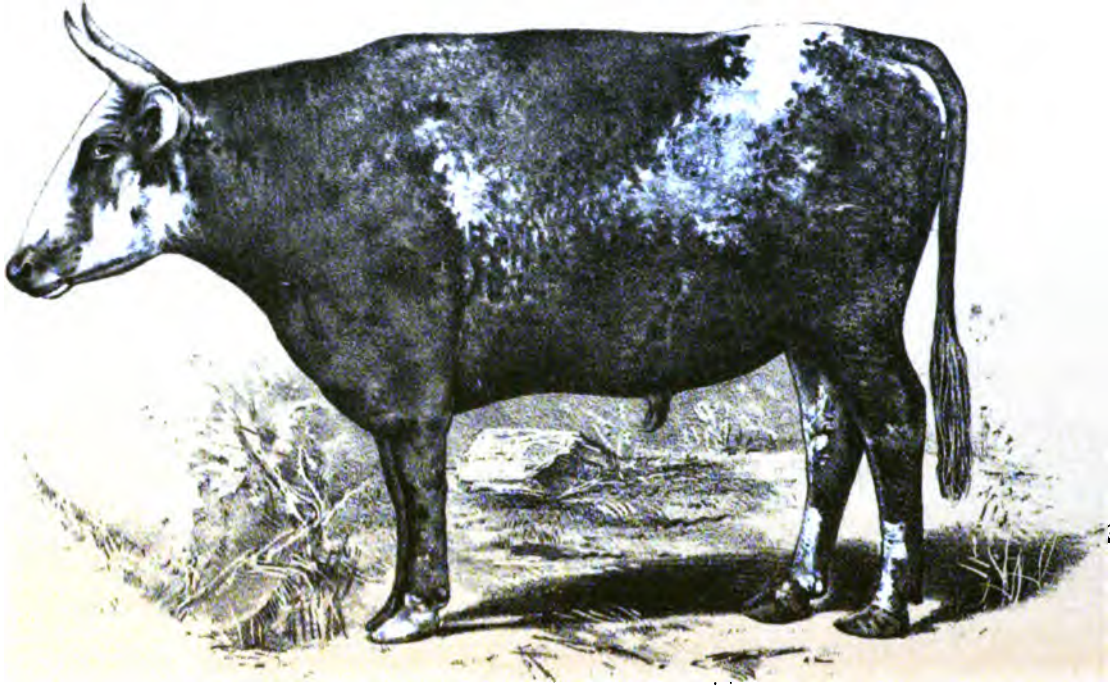
CHOLMOGORIAN COW



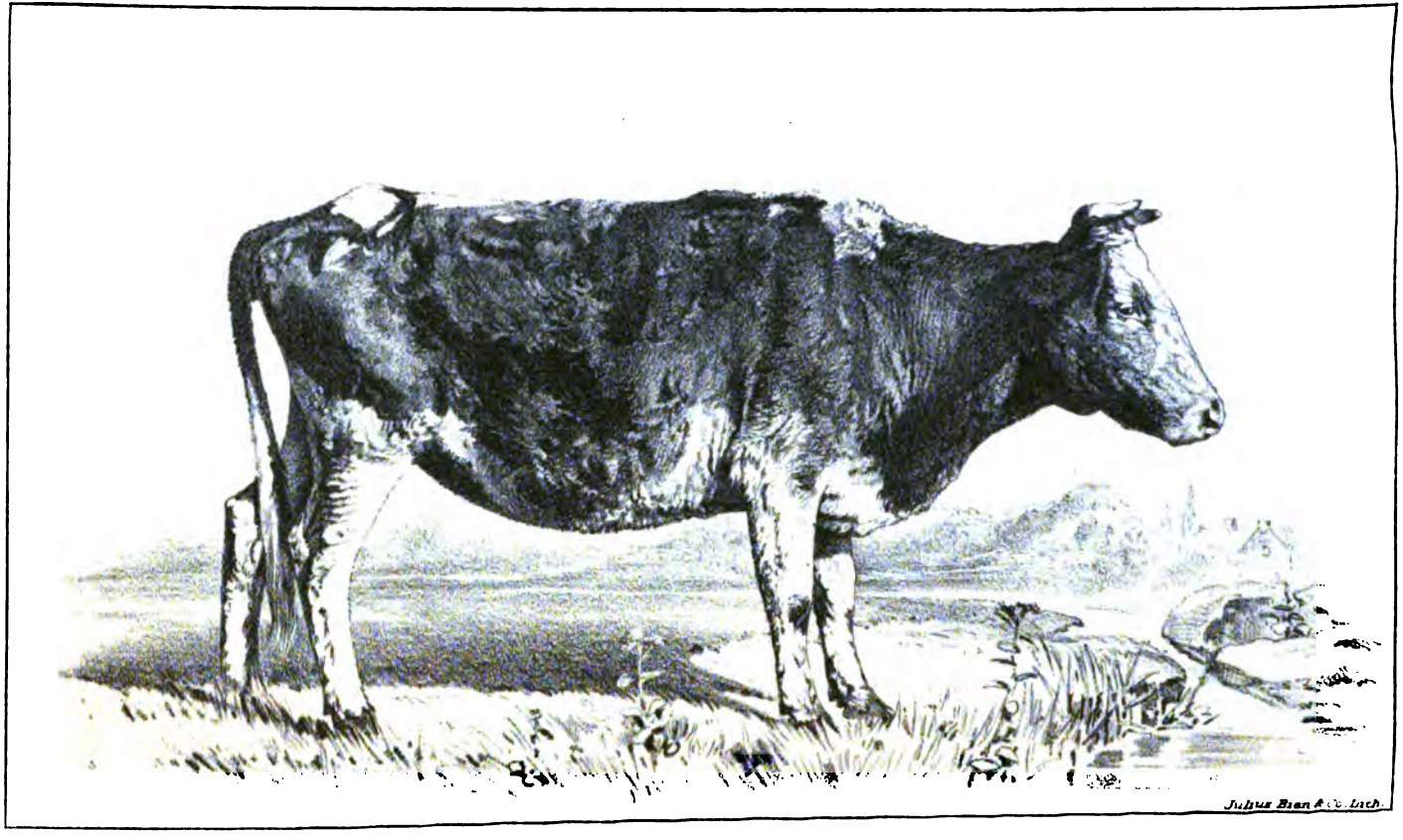
CHOLMOGORIAN COW



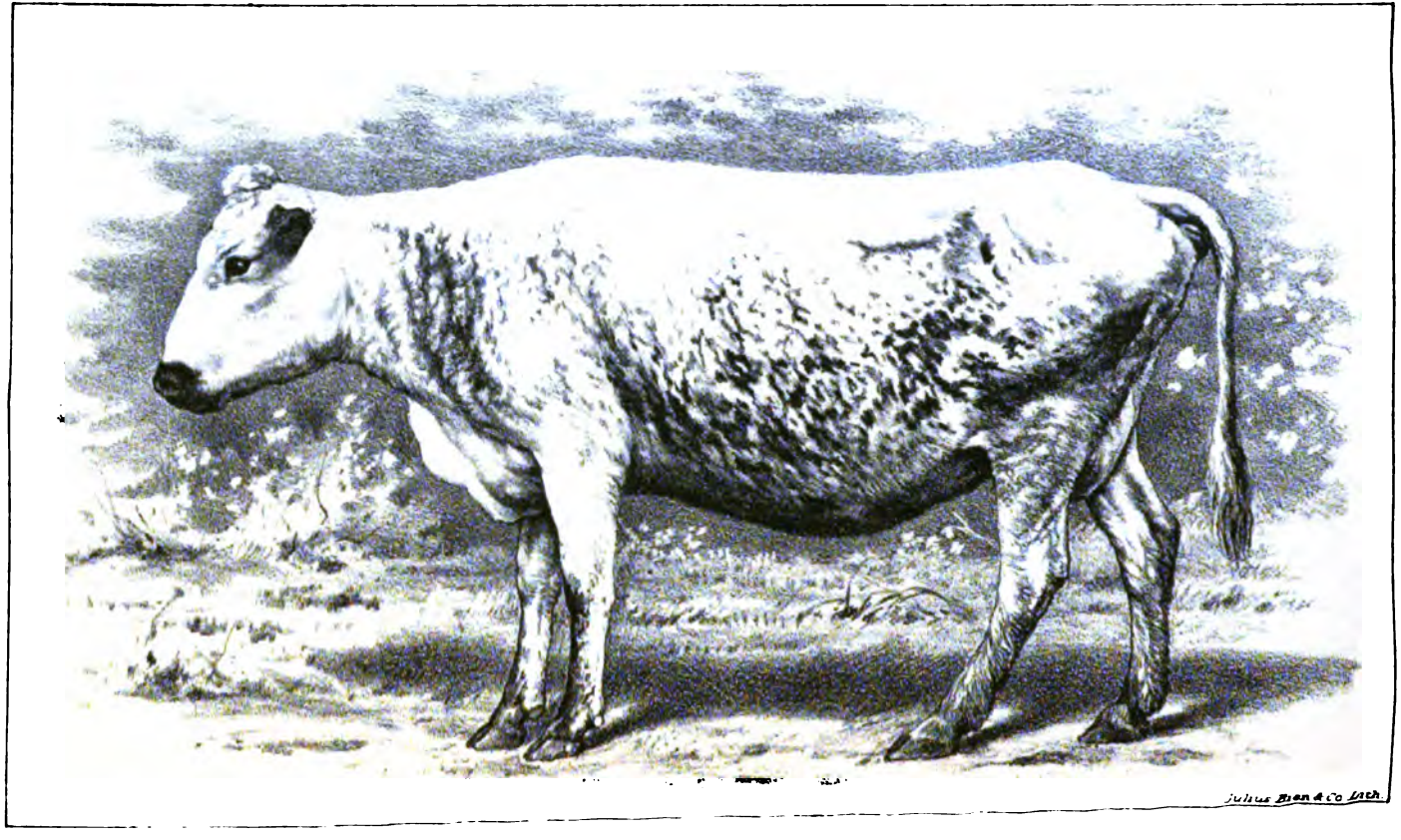
CHOLMOGORIAN COW



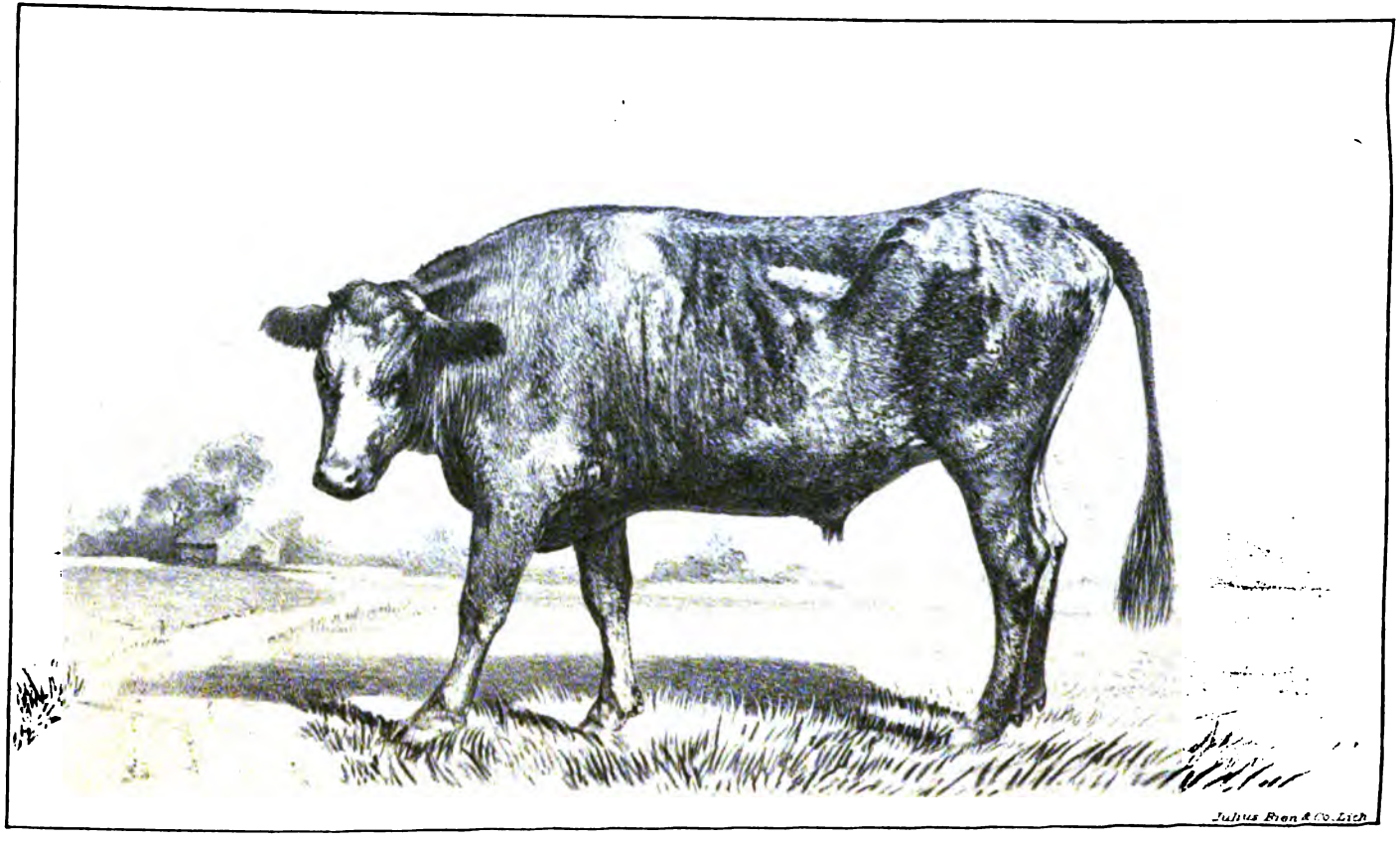
RED AND WHITE OX



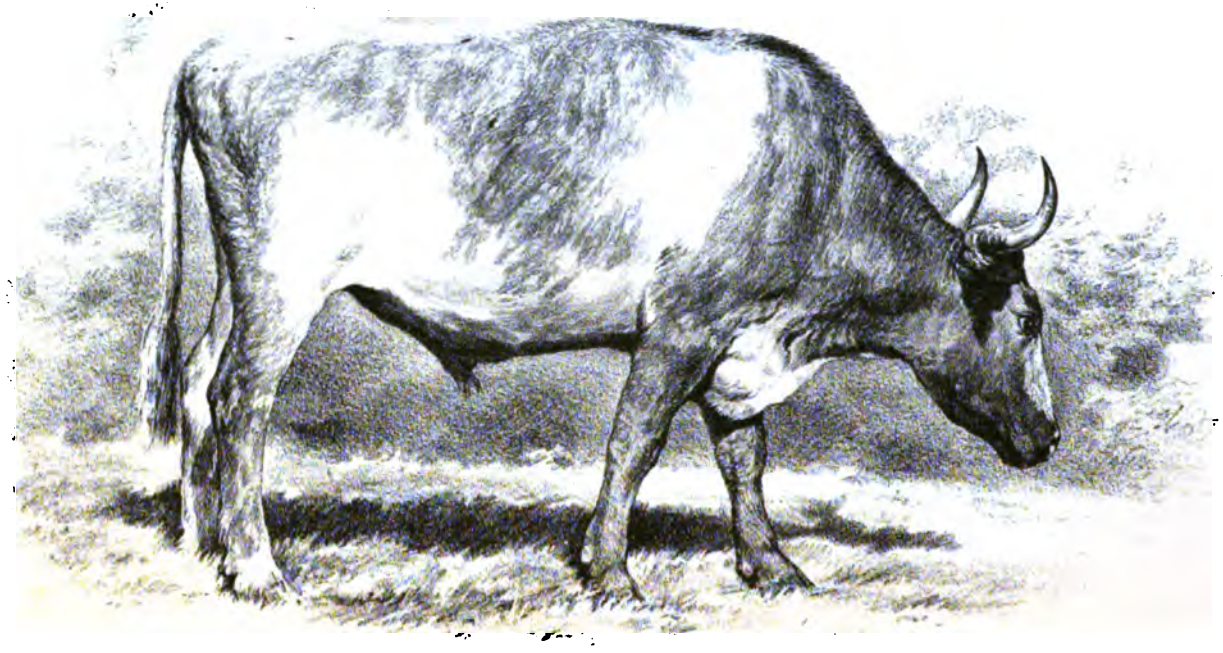
DUN COW



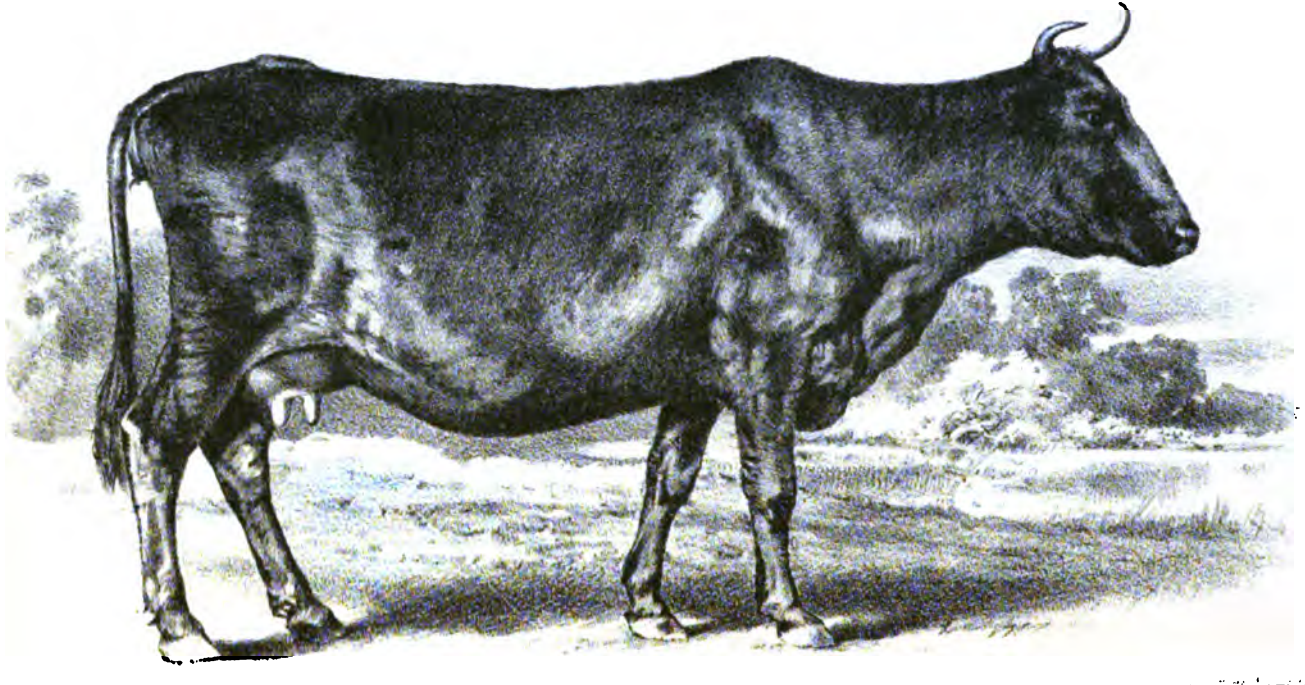
GRAY HORNLESS COW.



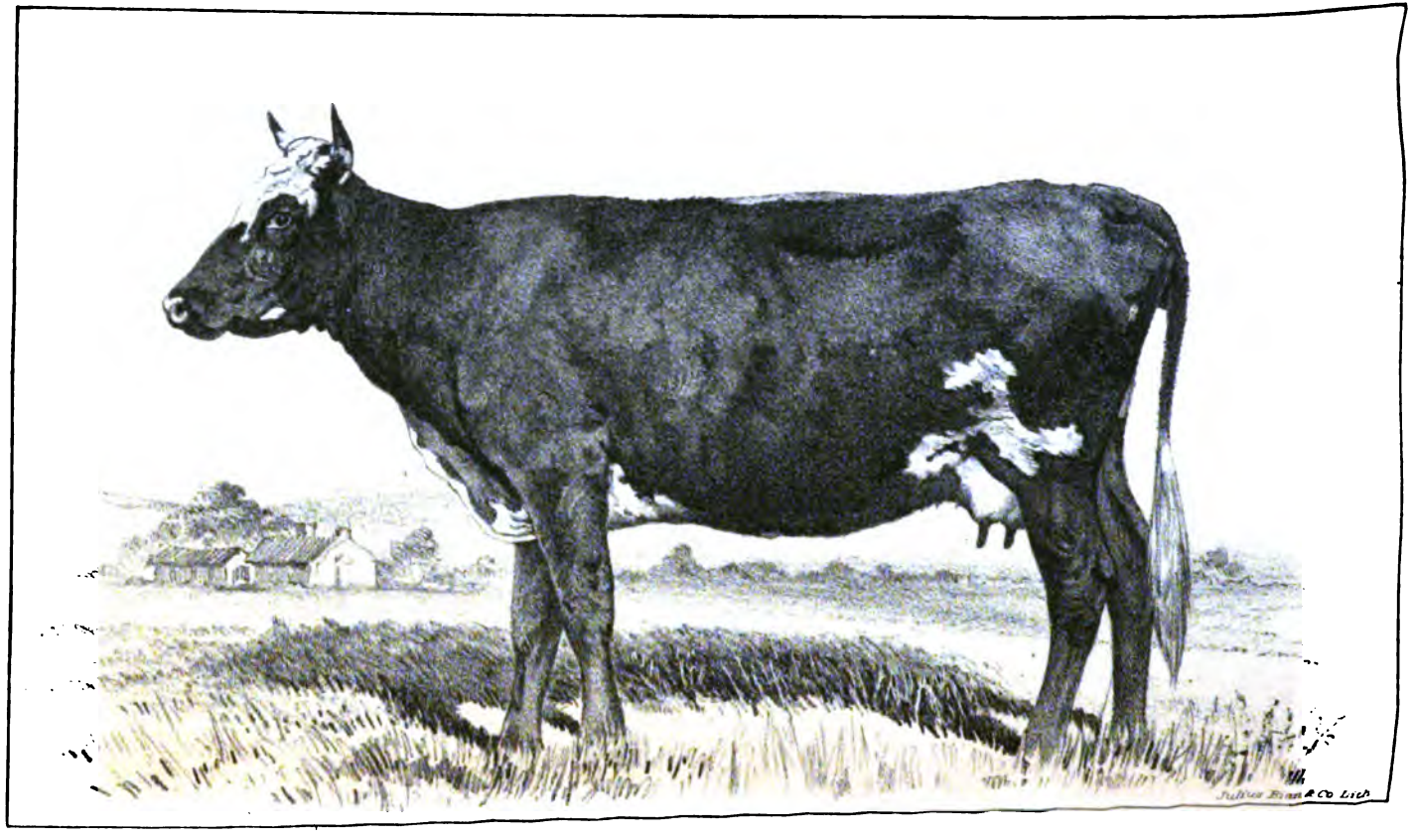
DARK GRAY HORNLESS OX



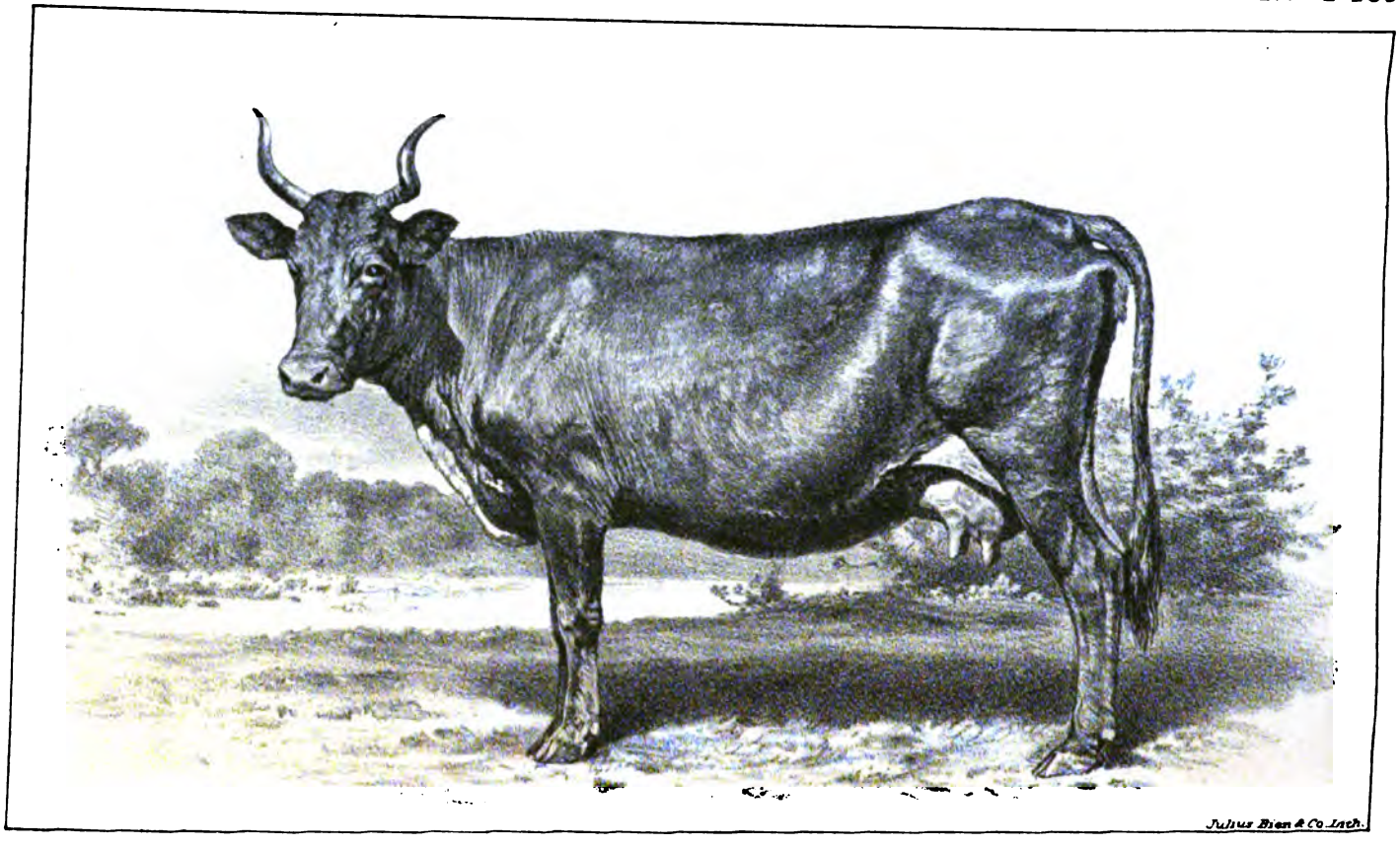
GRAY OX



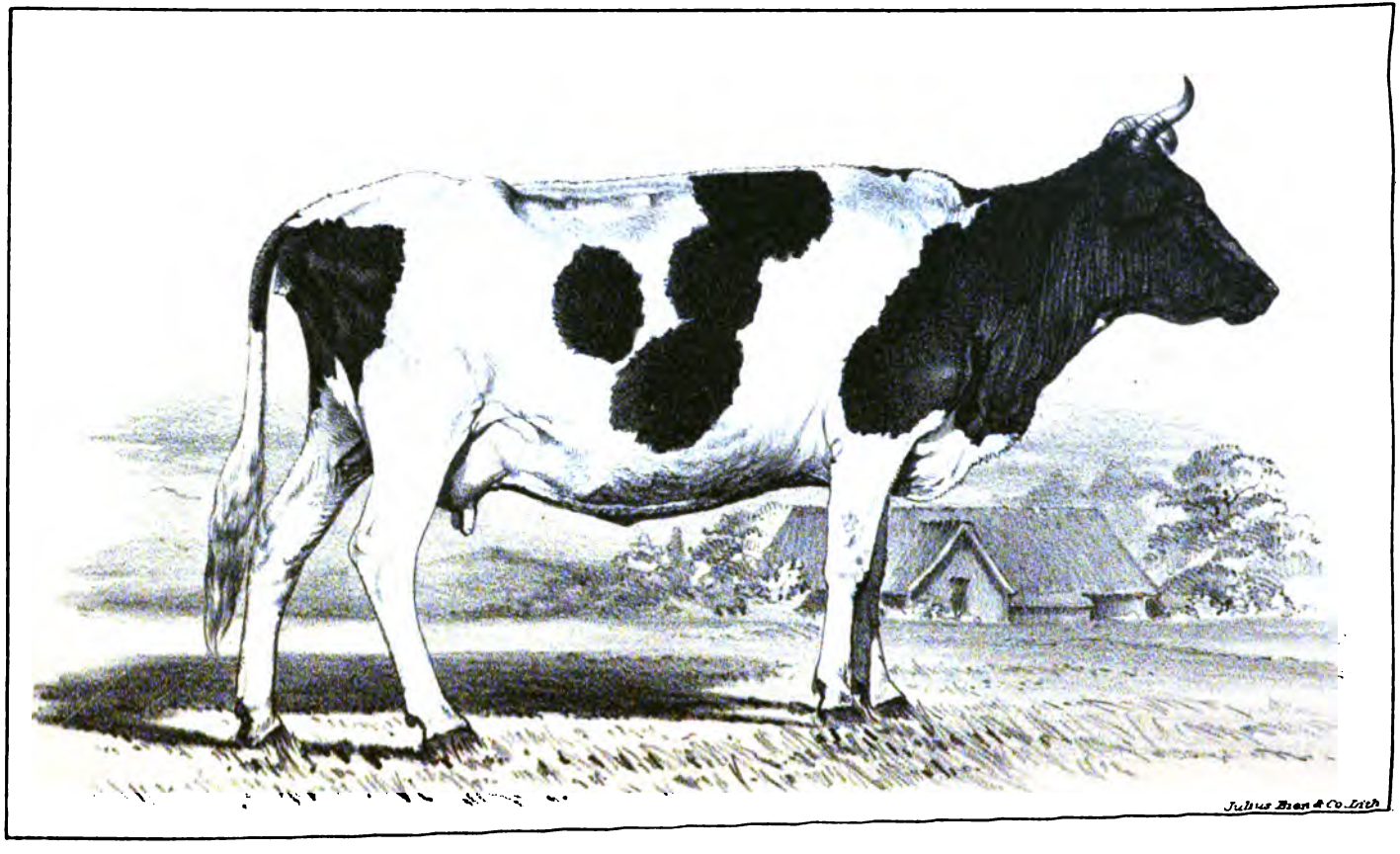
BLACK COW



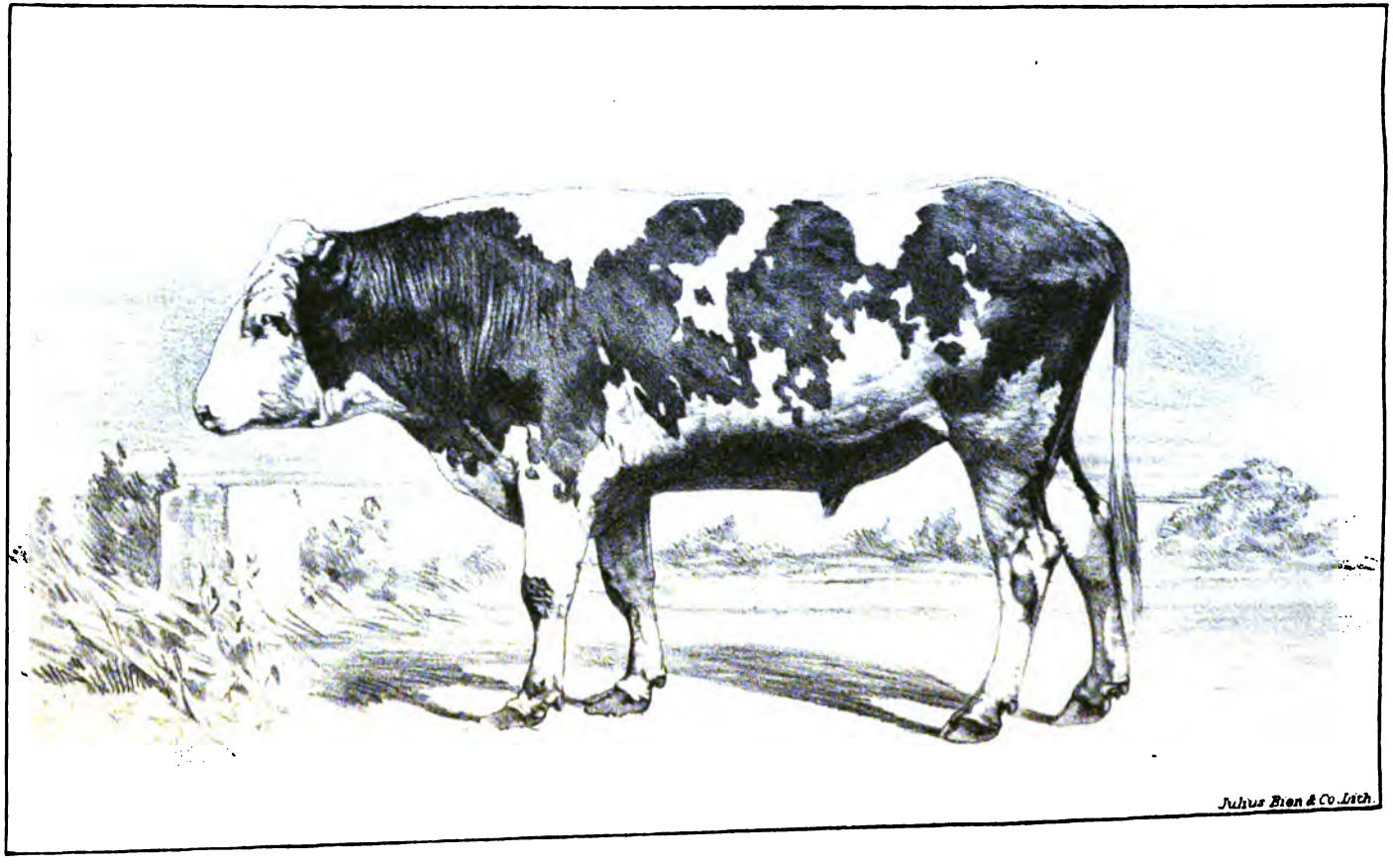
RED COW



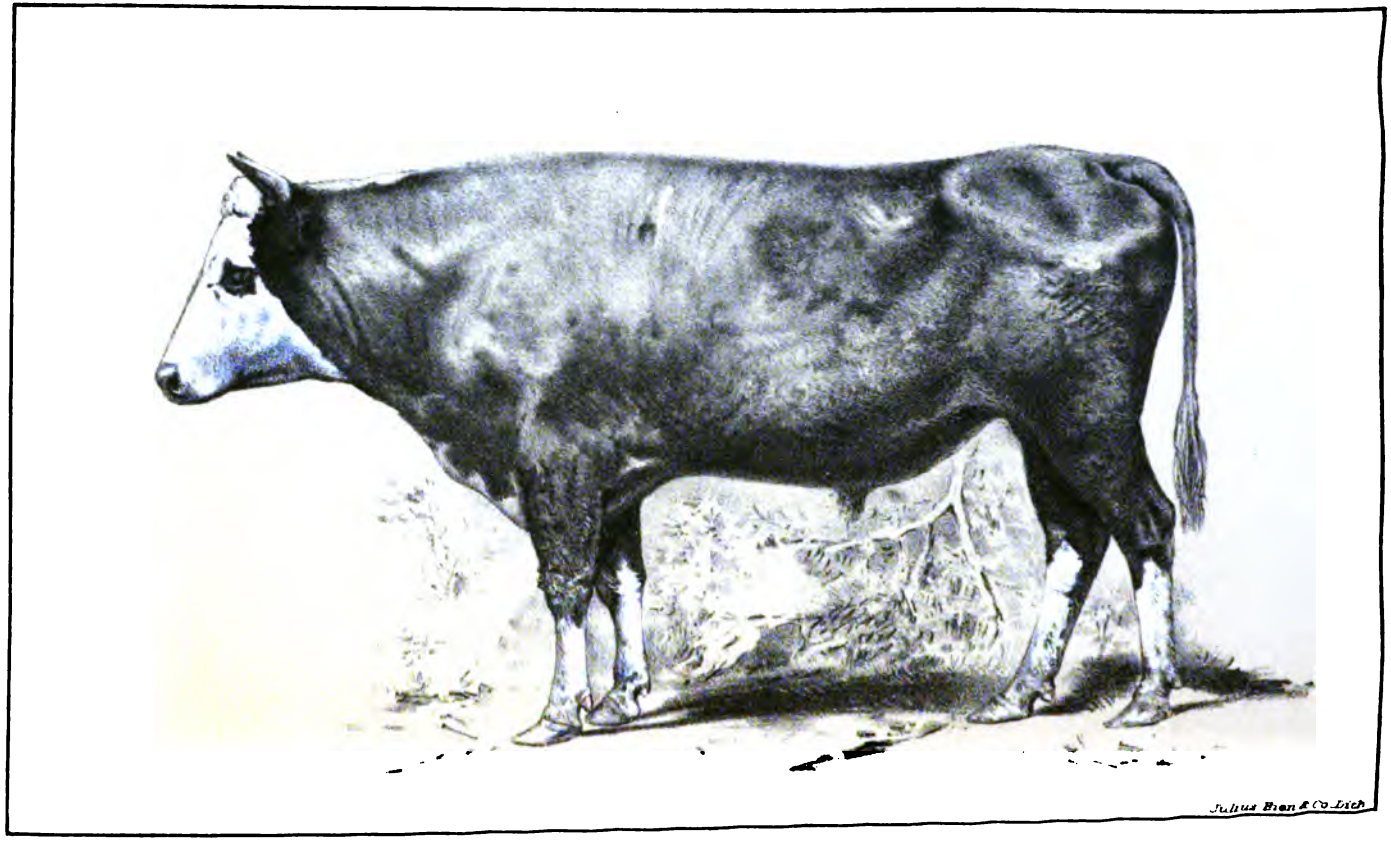
NATIVE COW.



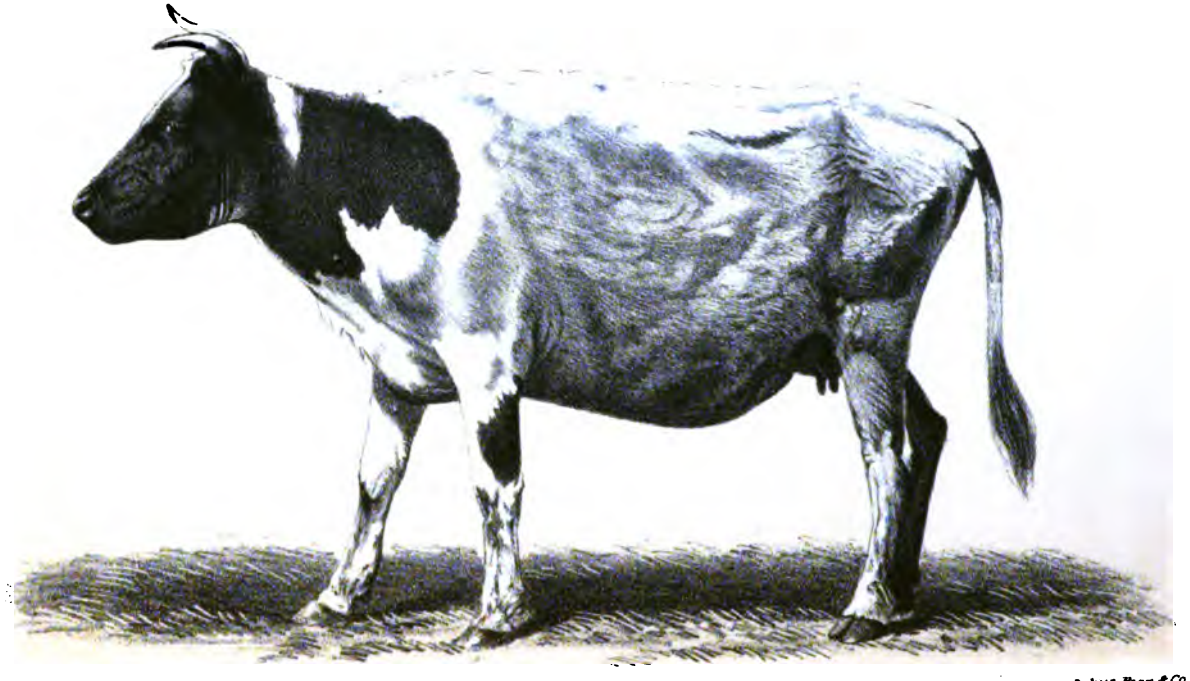
BLACK & WHITE COW



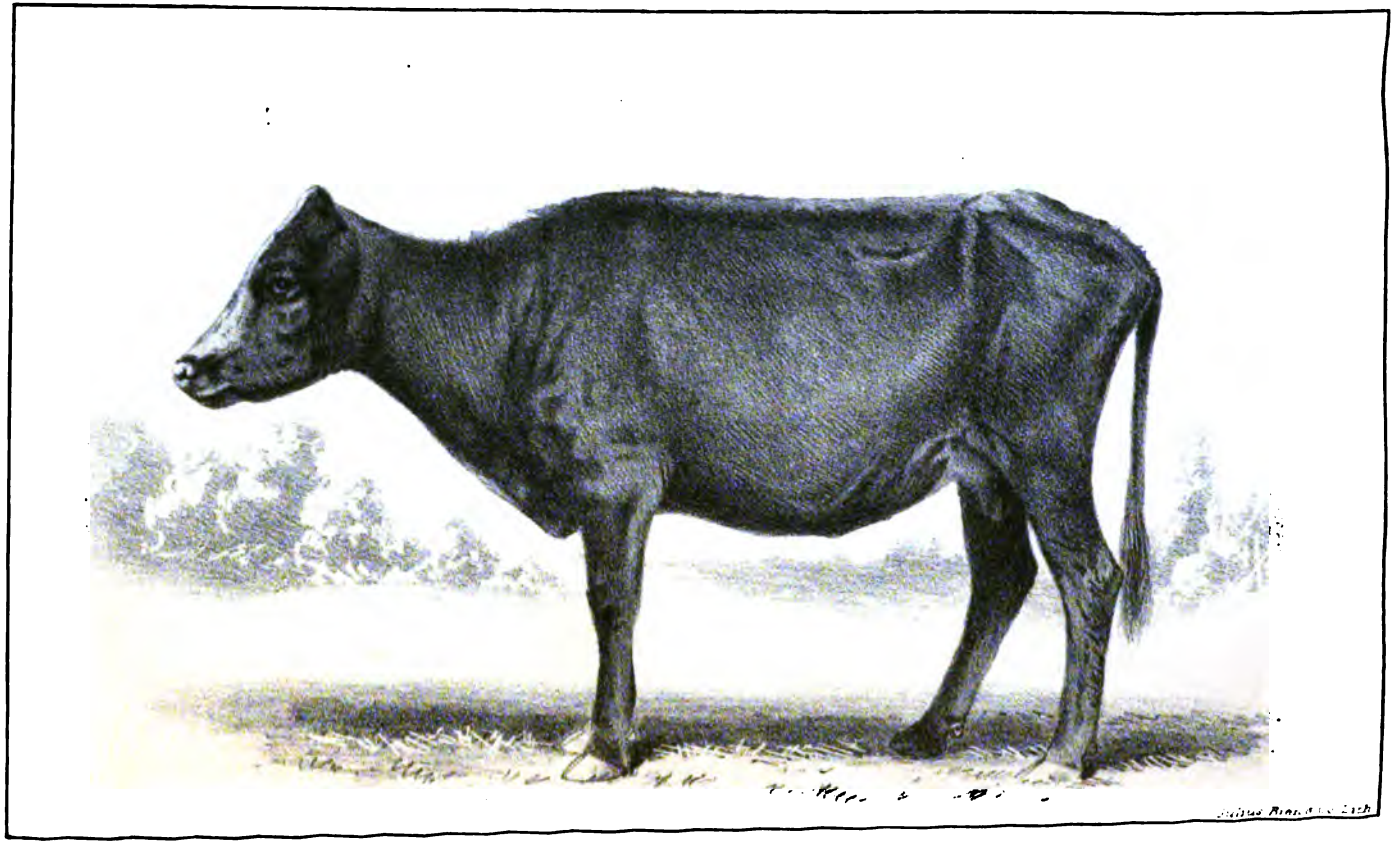
RED AND WHITE BULL



BLACK BULL

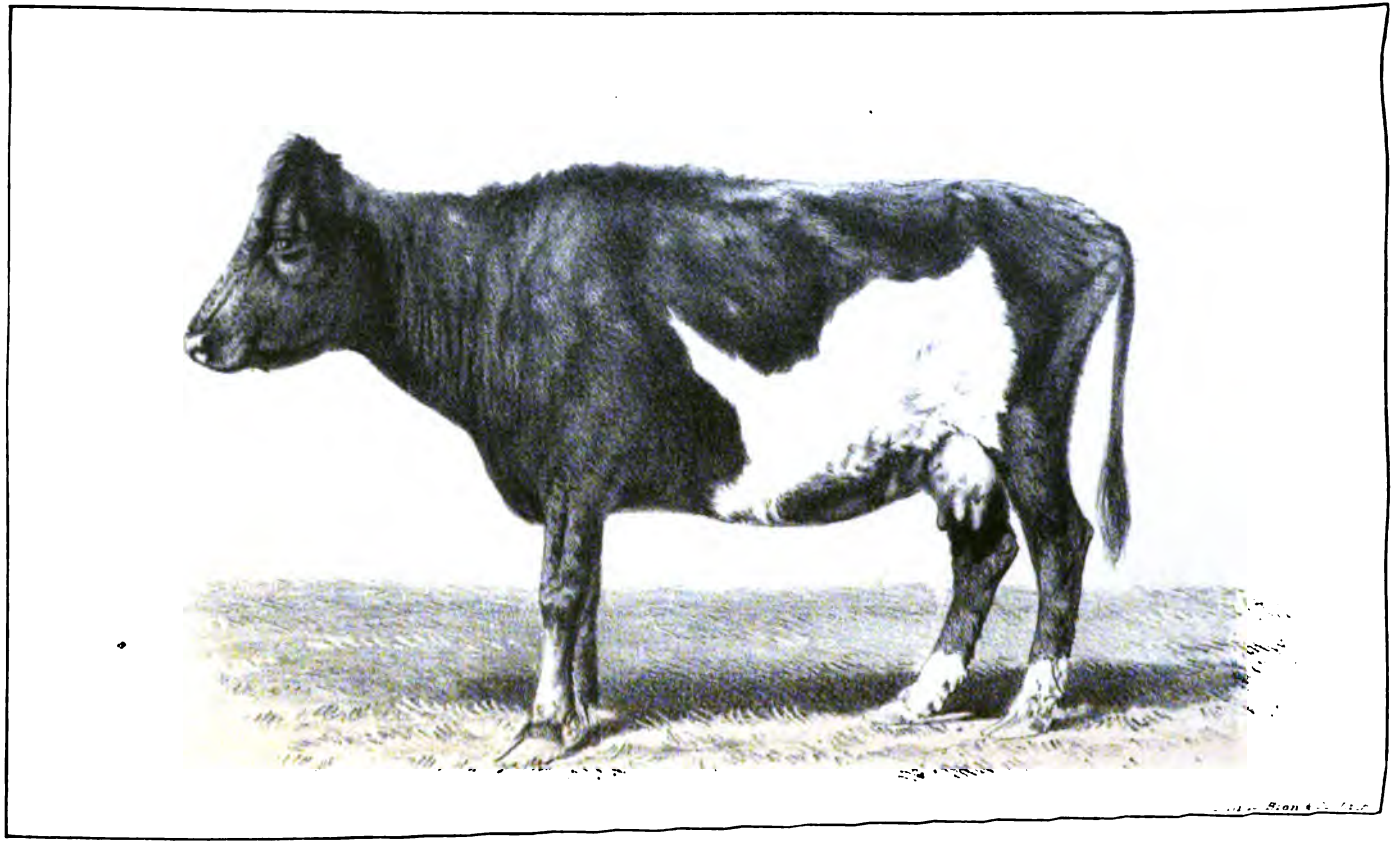


BLACK AND WHITE COW



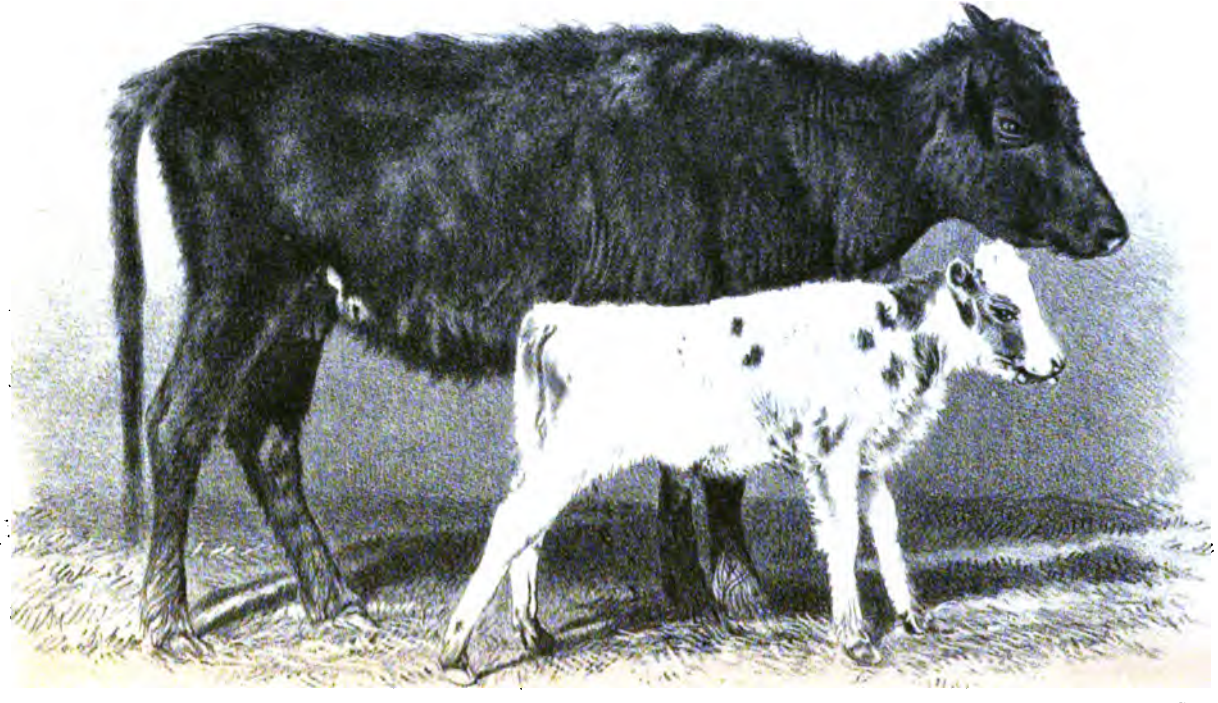
BLACK HORNLESS COW

PLATE 241

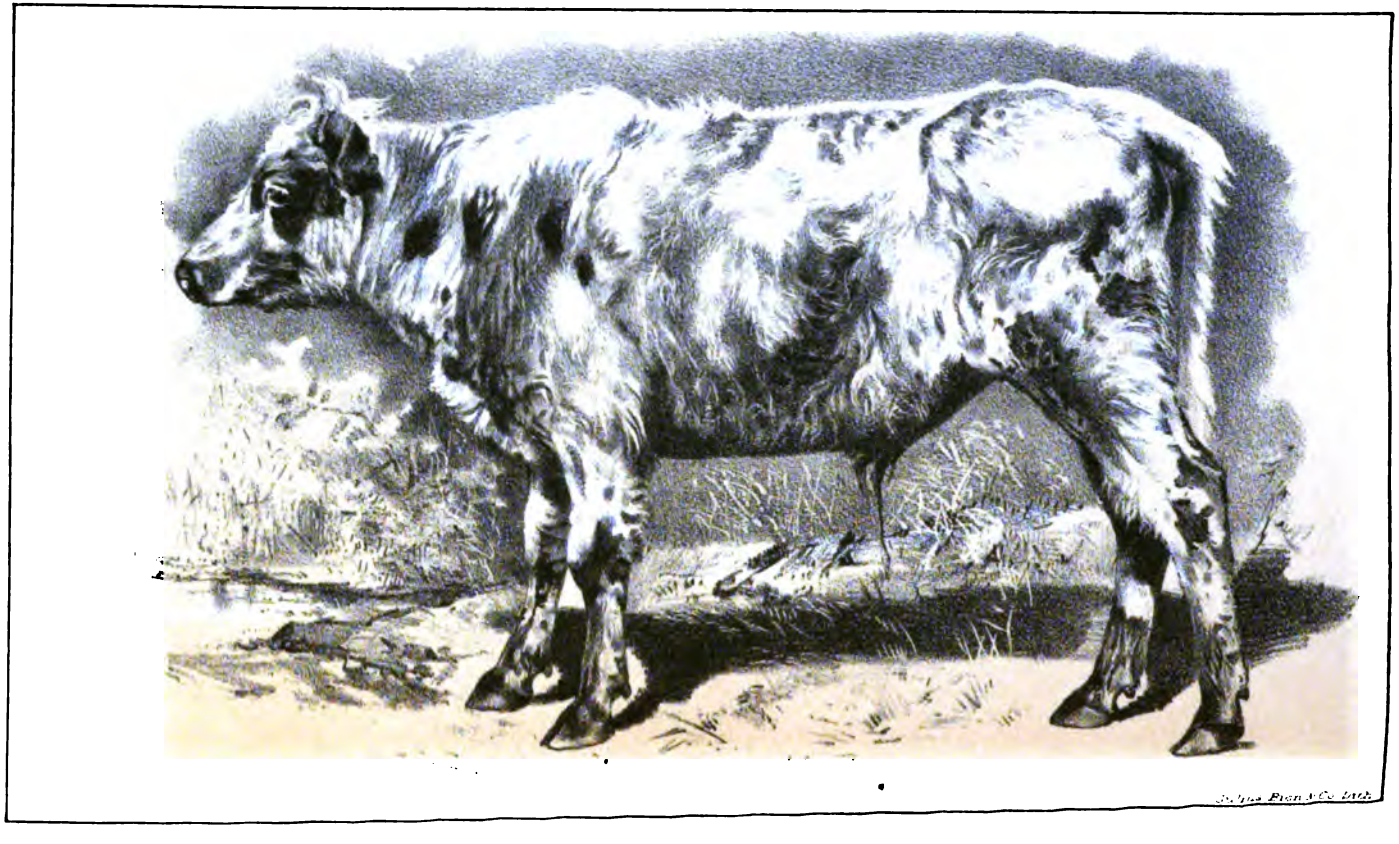


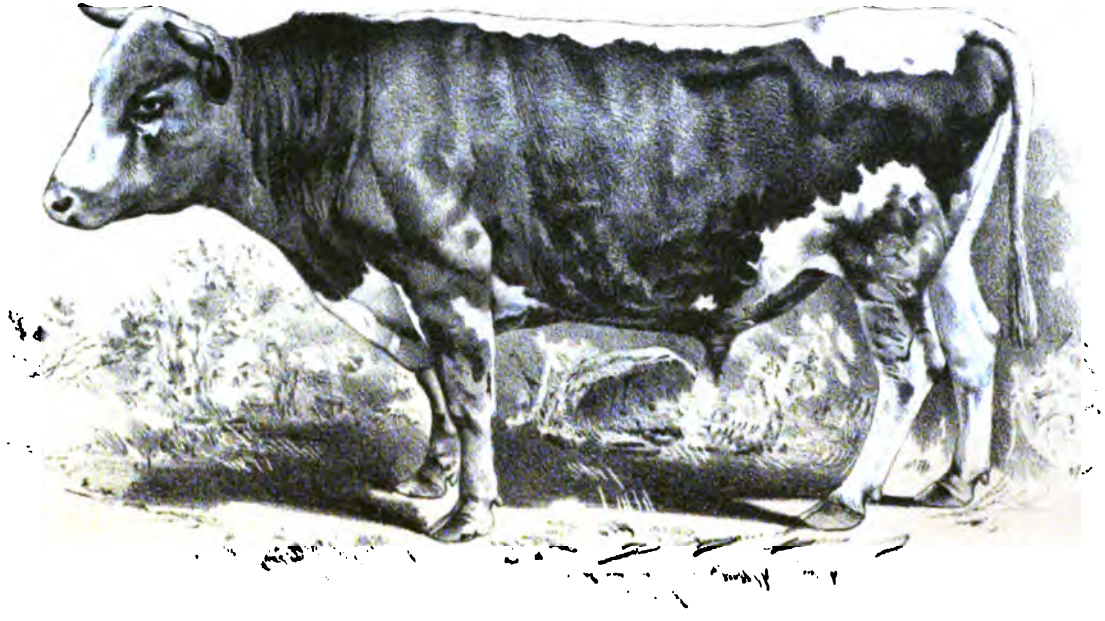
BLACK AND WHITE HORNLESS COW

PLATE 242



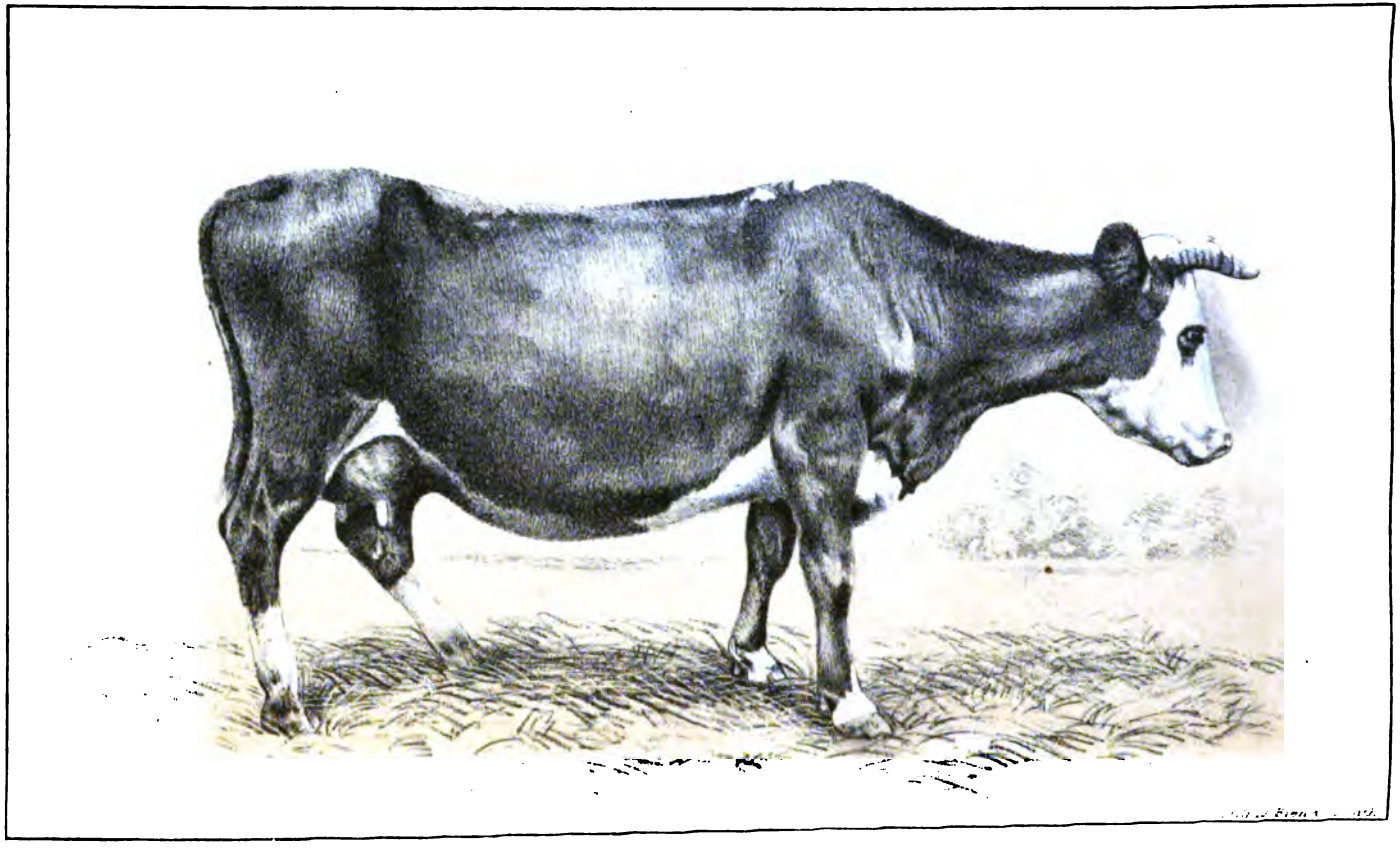
BLACK HORNLESS COW





Julius Beer & Co. Lith.

A FINNISH BULL



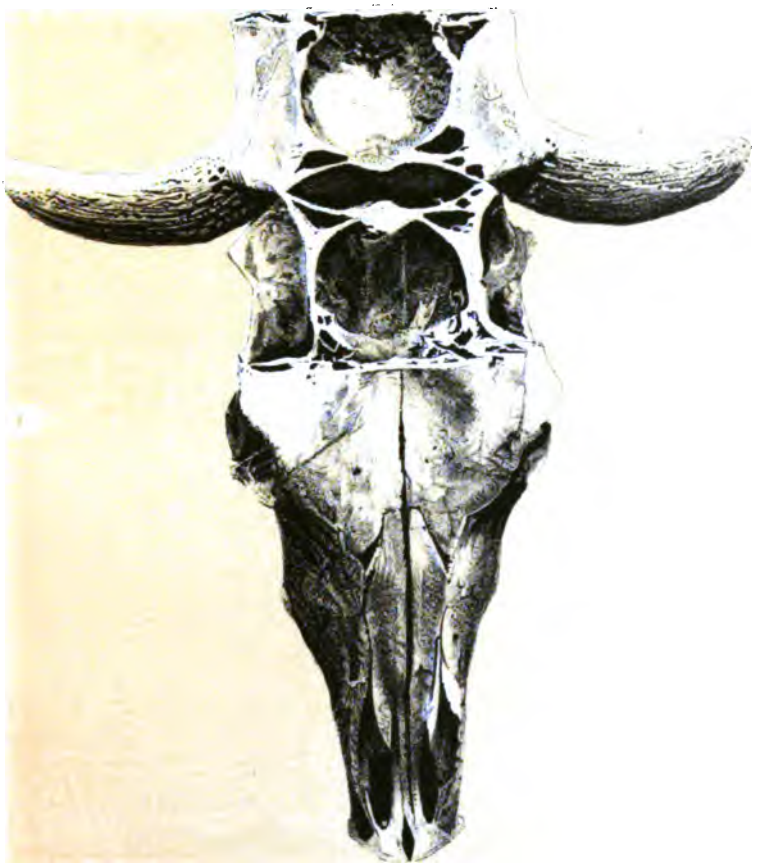
A FINNISH COW

Julius Bien & Co. Lith.

BOS PRIMIGENIUS

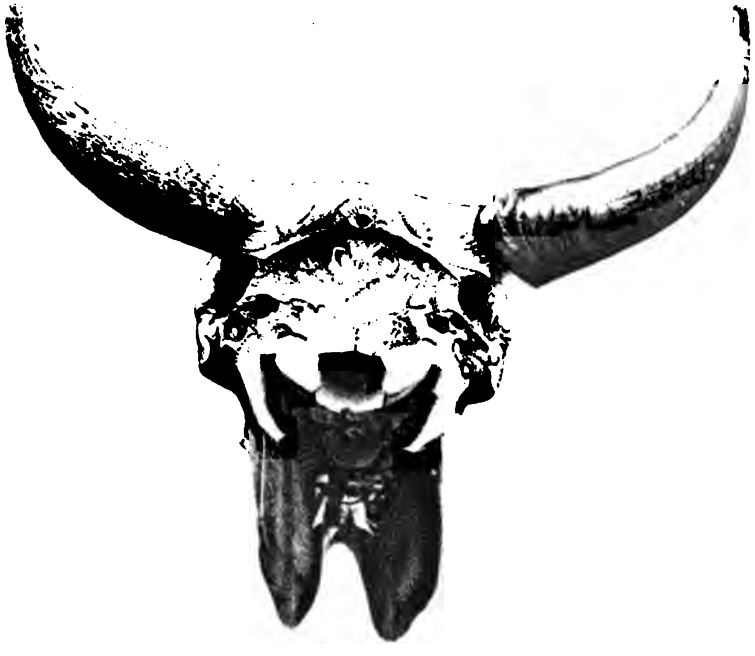
Julius Bien & Co. Lith.

BOS LATIFRONS.



Julius Bien & Co. Lith.

SKULL OF YAROSLAFF BULL.



Julius Beer & Co. Lith.

SKULL OF YAROSLAFF BULL

CATTLE IN FINLAND.

In compliance with circular of the 18th July, 1883, I have herewith the honor to forward answers to the several questions referred to therein.

There is an export of cattle from Finland to Sweden, but there is no import except a few now and then from Ayrshire, for breeding purposes.

HERMAN DONNER,
Vice and Acting Consul.

UNITED STATES CONSULATE,
Helsingfors, June 26, 1884.

SPECIAL STATISTICS CONCERNING CATTLE IN FINLAND.

Name of breed, &c.: Ayrshire, pure and half blood, crossed with original Finnish breed. Color, red and white, spotted, sometimes roan. They are the well-known Ayrshire type; have been bred pure for thirty years; originally from Scotland. Age at maturity four years, when the weight of meat is from 400 to 700 pounds. Size at maturity: Cow from 50″ to 80″; ox, from 56″ to 86″; while the bull at two and one-half years is from 54″ to 80″. Live weight: Cow, 800 to 1,000 pounds; bull, 1,200 to 1,300 pounds; ox, 1,000 to 1,100 pounds. Annual average production of milk from 3,200 to 6,000 pounds; from 23.3 to 26 pounds of milk produce 1 pound of butter; the average product being 180 pounds. No cheese is made in the neighborhood.

Topography of Finland: Altitude, 300 feet. Mean temperature, +3.7° C.; summer, +11.7°, July being the warmest (mean temperature, +17°); winter, —4.3° centigrade from November including April (January mean temperature, —7.8°). Soil, alluvial unsatisfactorily spread; loam mergel very scarce but plenty of vegetable moor soil; clay glacial and field clay; sandy, &c., rollstone gravel, down sand, and glacial sand.

Substratum: Granite, clay, gravel, &c.

Cultivated grasses: Timothy most cultivated and is gaining ground every year; red clover is cultivated, but more of Swedish "alsike" (*Arifalim hybridum*); for pasture while clover is mixed; rye-grass does not stand the Finnish winter; *Holcus lanatus* and *Alopecarus pratensis* are much used.

The cattle are housed for nine months and are at pasture only for three months; hay, oats (crushed), linseed cakes, wheat bran, oat, acorns, and straw are used for feed; on large farms the herds are usually kept pure and bulls imported from time to time from Ayrshire; on small farms crossed breeds are prominent. The butter is all exported to St. Petersburg and London.

POLISH CATTLE.

REPORT BY CONSUL RAWICZ, OF WARSAW.

I beg to acknowledge the receipt of the cattle circular of July 18 last, and in reply to transmit the following report on the condition of the cattle-raising industry in Poland.

The number of the Polish and foreign breeds is exceedingly limited, and in no proportion whatever to the demands of the local stock-breeders. Owing to the cheapness of the local milk and meat products and the competition with the "Steppe" and peasant cattle, the raising of the foreign breeds is entirely neglected.

The purchasing prices of the animals produced by this country are exceedingly variable, in consequence of the striking differences in their sizes and qualities.

A marketable milch cow weighs from 400 to 900 pounds, and costs from 20 to 65 rubles, while the price of an ox weighing from 600 to 1,100 pounds varies from 38 to 110 rubles and above.

The total number of cattle in the Kingdom of Poland amounts to 2,700,000 head, out of which number 700,000 head are in possession of large landed proprietors, while 2,000,000 head belong to the peasantry.

Nearly the whole of the Polish cattle stock is exclusively bred for the milk products to supply the local demands, and only the old and worn out animals are sold to the butchers of villages and smaller towns.

The larger towns and cities of the country supply their demands with cattle drawn chiefly from the "Steppe" governments of Russia.

The city of Warsaw, for instance, consumes annually about 65,000 head of the "Steppe" and only 3,000 head of native cattle, while the whole Kingdom of Poland consumes about 85,000 head of cattle.

Some of the larger landed proprietors draw considerable numbers of oxen from the Russian "Steppe" governments of Volynia, Podolia, and Bessarabia, fatten, and export them to Berlin and Vienna.

As regards the home demands of the dairy products it may be safely stated that hitherto almost everywhere, with the exception of larger towns, they were regulated by the amount of produce.

As a curious fact and illustrating the above, two towns situated in the government of Lubin, namely: Krasnik, 4,000 inhabitants, and Rachow, 1,900 inhabitants, some ten years ago, with 15 per cent. less population, consumed 360 and 120 gallons of fresh milk daily, respectively; at present the former consumes 1,120 gallons and the latter 400 gallons; this cannot be attributed to the increase of welfare, but to the increased production of milk in the vicinity.

The foregoing data have been collected by my order through some competent party, and as far as I compared them with other statements, I find them fully representing the actual state of the cattle-breeding industry in this country.

As to the blank forms sent me, I beg respectfully to express my regrets that I am unable to fill them up, for want of the statistical offices and the prohibition of keeping such offices by private parties.

I inclose five photographs of Polish cattle types.

JOSEPH RAWICZ,
Consul.

UNITED STATES CONSULATE,
Warsaw, November 3, 1883.

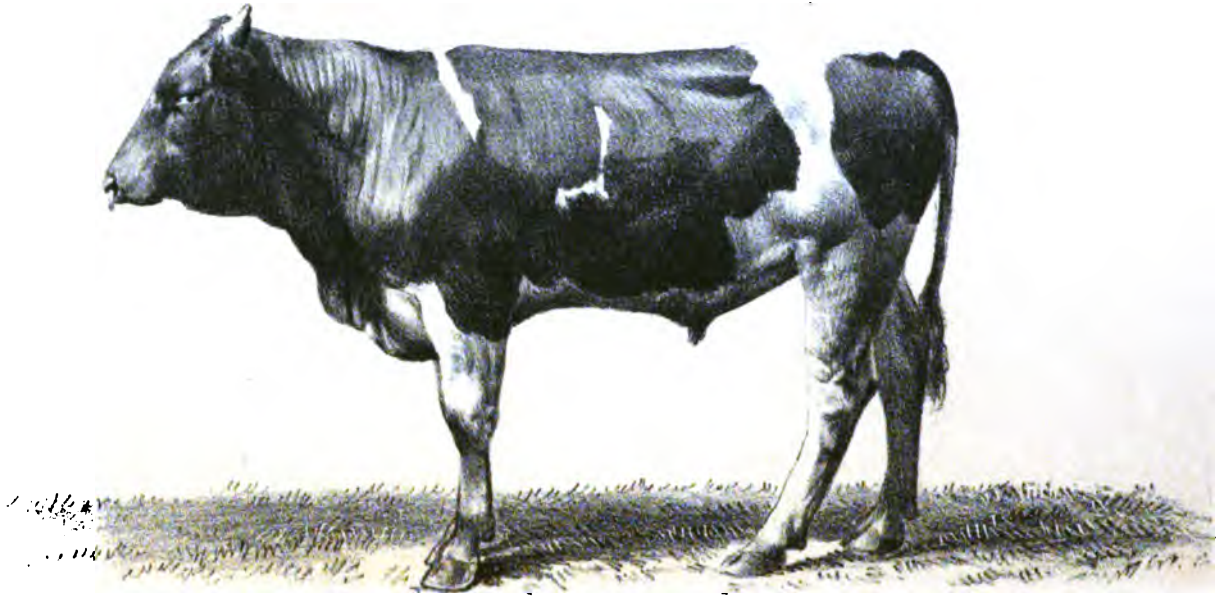
Julius Ries & Co. Lith

POLISH BULL

POLISH COW

Julius Bien & Co. lith.

POLISH BULL



Julius Brandt & Co. Lith.

BRITISH BULL

Julius Bien & Co. Lith.

POLISH BULL

HUNGARY.

MEAT AND DAIRY CATTLE IN HUNGARY.

REPORT BY CONSUL STERNE, OF BUDA-PESTH.

I herewith beg to submit all the general and statistical information which I have been able to obtain in response to the Department's cattle circular of July 18, 1883; at the same time I deem it proper to remark that many of the details of my report have been kindly furnished me by the honorable minister of commerce of Hungary and Mr. Tormay, the director of the veterinary academy of Buda-Pesth.

CATTLE RAISING IN HUNGARY.

As to generalities, I shall begin by stating the results reached in Hungary by the systematic breeding with the cattle native to the state, and also the results reached by the introduction of cattle of foreign breeds.

Though Hungary has been making great efforts in the last decade to throw off its purely agricultural character, it retains such to a great extent at this day. Like that of few other European countries, her land is more generally adapted to agriculture and her people are by long-acquired habits more inclined to the occupation of farming.

Thus also the raising of cattle was always an industry of great importance to the state, only exceeded by that of grain production. The great competition, however, in late years, by other countries, has made grain-raising so unprofitable that, also considering the favorable results reached in other countries by stock-raising, the people have found it proper to turn their attention more in this direction, and though it is only recently comparatively that systematic efforts have been made, I think the state has already cause to congratulate itself on the results secured thus far.

HUNGARIAN MEAT AND WORK CATTLE.

It being natural that the native cattle is best adapted to the country of its home, much attention has been given to improve and perfect the home race, and this has resulted so successfully that the Hungarian cattle may already be considered very superior animals, especially for the butcher and heavy work. For these purposes there have therefore been very few experiments made in the introduction of animals of foreign race.

CROSS BREEDS FOR DAIRYING.

Of late, however, it has appeared that "dairy farming" is the more profitable branch of stock-raising. The country is therefore making its experiments and applying the results of these more in this direction. Though the experiments with foreign breeds have not been generally satisfactory, there have been a few which have resulted so well that

for dairy farming these have already been accepted as standard stock, and they no doubt will soon largely replace the native cattle for the purpose, though these cannot be called unprofitable dairy animals either.

The most satisfactory of these experiments have been had with the cattle from the Alps (Switzerland and the Tyrol), and these are already practically bred in the north and west of Hungary, also on the eastern border on the higher situated pastures of the Karpathian Mountains and their valleys. Of the the above the "Red Spotted" (the "Pinzgauer" race) and the "Brown cattle" (the race "Brachiceros") deserve to be specially mentioned.

Positively bad results have been made with the cattle from Holland and Oldenburg and those from the northwest coast of the continent generally.

STATE ENCOURAGEMENT OF CATTLE-BREEDING.

In this work for improvement the people are greatly assisted by the government of the state, not only by very instructive and commendable methods of instruction, but also by financial aid where such is needed; there are other privileges granted as a further stimulant to those who will be guided by the system adopted.

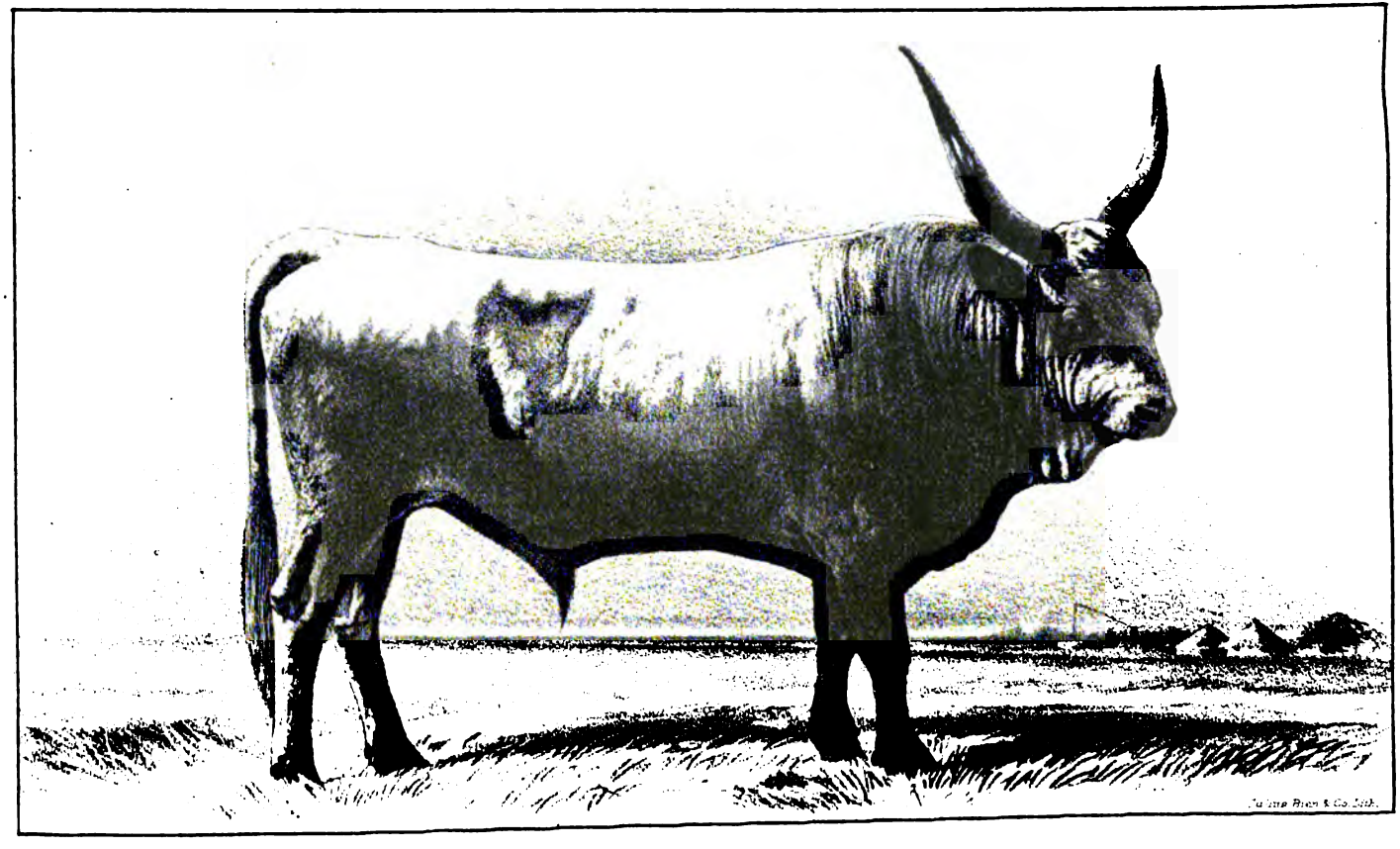
To go into details: The state has been divided into breeding districts, in each of which model farms have been established, mostly on lands belonging to the Crown. These farms are managed and held either by the state authorities or by the wealthy gentry, some of whom show exceptional energy and enterprise in this field. They are stocked with the best breeding stock suitable to the locality, either of the native or foreign races.

From these centers the individual farmers or breeders, and also village consumers, are supplied with breeding animals on very favorable terms of payment, upon the condition that the progeny be placed at the disposal of the mother establishment for further sale and distribution. Thus the state is being stocked only with such animals as have proven by experiment and practice to be best adapted not only to the country at large but also to the separate districts, and in the same proportion mongrel, defective breeds are gradually being extinguished. In a short time seventy-six such model farms have been created, one of which alone contains four hundred native bulls. With such a system it can be reasonably expected that soon a complete change can be brought about in the direction proving to be the most practical.

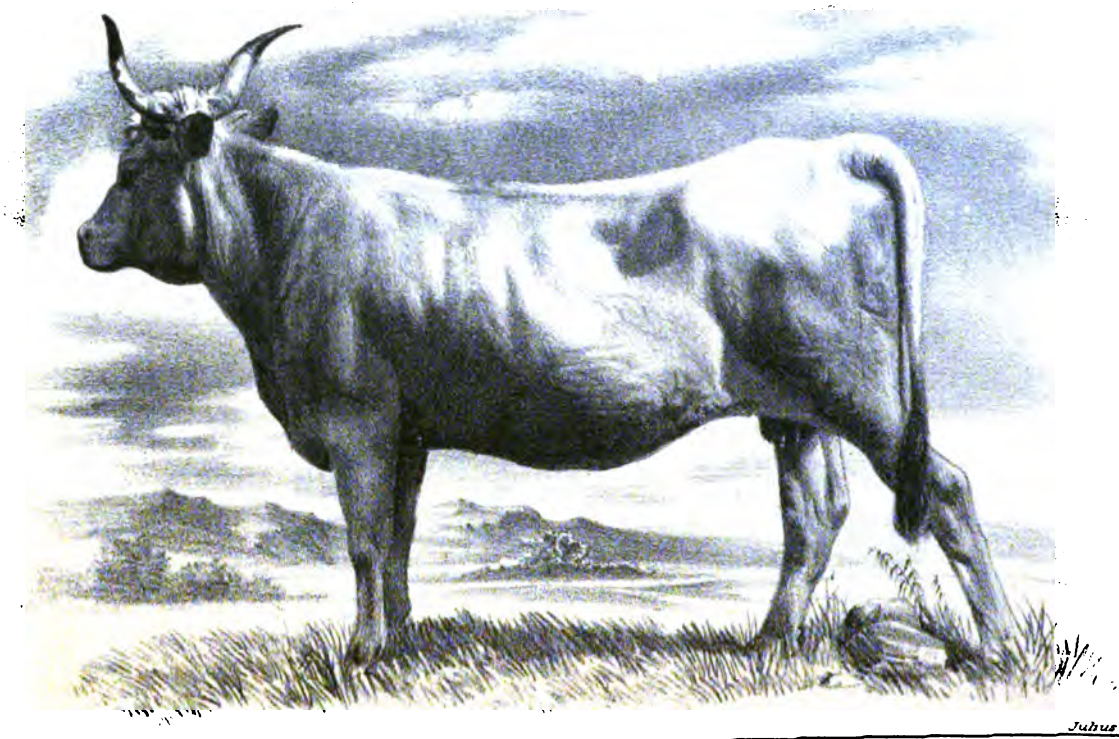
THE WHITE CATTLE OF HUNGARY.

There are two races of cattle in Hungary which can be called native; the so-called "White cattle" and the "Buffalo." Of these two the former seems to be very well adapted for domestication in the United States and becoming thus of special interest. I shall here give a short sketch of the animal as far as my limited knowledge of the subject in its technicalities will safely permit me to venture. I hope, however, the people of the United States may be able to draw practical conclusions from this sketch, the foregoing g eneralities, and the statistical results accompanying my report.

I herewith transmit two photographs of Hungarian cattle, "the White native," referred to at length in my previous dispatch. I think these pictures are very fine ones.



WHITE NATIVE HUNGARIAN BULL



WHITE NATIVE HUNGARIAN COW

The horns of the cow are exceptionally short.

As a race the "White cattle" belong to the group "Bos taurus primigenius," commonly called "Podolian" and it exists more particularly in Eastern Europe. Although the animal here in Hungary is not considered quite perfect as yet, it is claimed that, of the race, those here have thus far reached the highest state of perfection, and the systematic breeding applied will no doubt soon develop the perfect animal.

Meat and labor qualities.—The qualities mainly recommending it are two; capacity for fattening and the quantity and quality of meat produced, and their great usefulness as working animals. The latter quality makes them especially valuable here where the ox is the principal motor, and I think that this should equally recommend them to the "Far West" of the United States, where the breaking up of the new soil makes the steady, heavy work of the ox more practical than the light, quick work of the horse. As a sample I am informed that a pair of oxen will easily plow about 1½ acres of land 6 inches deep per day. As to their fattening capacity I must add the caution that the animal does not mature as rapidly as that of some other races.

The "White cattle" is raised in all parts of Hungary, since it prospers on every class of soil; the poor sandy, the peat and clay, or the richest alluvial. For localities at an elevation of more than 3,500 feet above sea-level the animal is not adapted. It is, therefore, found more particularly where grain production is practiced, thus enabling it to be made useful as a draft animal, while being also near the distilleries for fattening.

Description.—In the physical description accompanying this report the good average animal is spoken of.

The color is a silvery white or gray, with black mouth and nostrils, and the tail ending in a long black tassel. Animals of a pure white color with a pinky mouth are found occasionally, but these are not popular owing to their sensitiveness to the influence of the weather. The head is small, the line of the forehead straight and covered with a more or less thick and soft tuft of hair; the nose is slightly rounded. The head of the bull is more massive, with coarser outlines, the hair a little darker and more inclined to curl.

The immense and beautiful horns grow a little horizontal from the sides of the head before they curve up and outward; many specimens over a meter in length are found, those a yard long being quite common. Perfection in the correct shape of the horns is highly valued, this being one of the signs of purity of race. Besides the horns have a commercial value as a substitute for whalebone, and, when properly mounted, make beautiful articles of decoration. Altogether the head gives the animal quite a noble, majestic appearance.

The eyes face rather outwardly, are very large, black, almond-shaped, lively, and frequently more fiery than desired.

The ears are firm, reasonably hairy, and point sidewise, not drooping.

The neck is broad, carried high, and is from 10 to 15 per cent. longer than the head, measuring each from the line of the forehead.

The back is long, broad, and very muscular, sway-backed or otherwise poorly shaped animals being rarely met with; the croup is broad and strong; the tail is also strong.

The sides of the beast are broad, long, and deep, in consequence of which the chests have extra large dimensions, which, with their very capable lungs, cause the animal to be so specially well adapted as draft animals.

The withers are long and broad; also the loins, though these are sometimes found longer than they should properly be.

The limbs are very strong and firm; the shoulder muscular, finely shaped, and compact; the forearm is flat, very broad, and covered with visible muscles; the knee is broad; the shin short without coarse bones; the sinews clearly defined; the fetlock very shapely and in good porportion, and the hoofs so strong and firm that it becomes necessary to shoe working animals only on the roughest roads.

Measurement and weight.—The following is a detail measurement of good average animals:

Description.	Bull.	Cow.
Length of head.....Meters..	55	54.3
Breadth of head, widest part.....do....	25.2	24.5
Breadth of head, narrowest part.....do....	22.3	19.5
Length of neck.....do....	61	62
Length of back to point of last rib.....do....	65	63
Total length from line of forehead to point of "ilium".....do....	224	218
Height at withers.....do....	154	150
Girth measure.....do....	212	191
Breadth of hips.....do....	54	55
Total length, as above, of extra animals.....do....	245	237
Total height, as above, of extra animals.....do....	157	158
Total girth measure, as above, of extra animals.....do....	224	212
Weight of medium animals.....pounds..	1,381	1,214
Weight of extra animals.....do....	1,813	1,499

Fattening qualities.—As to their capacity for fattening, it may serve as a sample that a certain herd of seven hundred and forty-two old, long-worked oxen were brought in one hundred and eighteen days of fattening from an average weight of 1,260 pounds to 1,565 pounds. Younger animals have been known to gain as much as 3.54 pounds per day in distilleries, and equally good results have been secured with first-class farm feeding. In short, it is claimed, after many tests, that no race of cattle will compare with this one in the results of systematic fattening.

Dairy qualities.—I am informed, as to their quality for the dairy, that, in more favorable localities much better results have been reached than those stated in the statistical table herewith; that these showings allude only to medium animals under medium circumstances.

Price.—In price they range as follows: Bulls of medium to first-class quality are worth from $80 to $120 for three-year-olds, and from $60 to $100 for two-year-olds; exceptionally fine animals, of course, in proportion more. Cows are worth from $32 to $60; year-old calves of either sex from $20 to $40. Upon application I can furnish the addresses of breeders of the more thoroughbred herds.

THE HUNGARIAN BUFFALO CATTLE.

I have not been able to obtain an accurate description of the other race of native cattle of Hungary, the "Buffalo," but from my personal observation and information I can say the following:

The Buffalo is a black, shaggy, uncouth-looking animal, with rather horizontally lying head, backward drooping, short, and heavy horns; it is far more docile than its appearance would indicate, and on account of several of its traits it might justly be called the mule of Hungary. Its extreme toughness and, if I may call it so, its modesty in require-

nent of food and care, are its most remarkable qualities. It is therefore specially popular in localities where food is neither plenty nor good, and everywhere it receives the treatment of a "step-child" in this respect.

It is fond of the water and thrives best in swampy sections, will, in fact, decrease in size if kept in too dry localities. It is a very good work animal where speed is not required, displaying again in this the equanimity of the mule. The milk is noted for its richness.

The Buffalo is raised, in numbers of any consequence, only on the low bottom lands of the Danube, the Theiss, and the Drave, all these districts being noted for their dampness. For the same reason I think he could be practically introduced in the southern portions of the United States; in Florida, for instance, where, as it is, the domestic cattle do not thrive so well.

There are also a few herds of thoroughbred Buffaloes kept up here with the object of maintaining the quality of the race. First-class specimens can be had for from $50 to $100.

HOUSING AND FEEDING.

The usual manner of keeping the cattle here is as follows:

In summer they are allowed the run of the fields; these not being fenced, the animals are in charge of herders, large herds being under professional herders, while the women or children look after the animals of the smaller farmers.

In winter the small farmers keep their stock in stables. The large herds are kept in sheds, which are protected towards the north, while the south sides are open to allow the animals the run of the adjoining paddocks during day-time; sometimes they are kept altogether unprotected during winter, since the animal can easily stand 4½° F. below zero. But all have to be fed during winter, Hungary seemingly not having those grasses from which, as in our "Far West," cattle can make their own living during winter. The small farmer feeds cut feed, while the large herds receive straw, corn-stalks, a little corn, and poor hay.

BREEDING IN HUNGARY.

Inbreeding is never deviated from, crosses being altogether disqualified as breeding stock.

The bull is permitted to run with the herd in March, remaining with it three or four months. Calves begin to be dropped in January, and it is claimed that those which are dropped on the snow are the hardiest and best.

Breeding begins with the third year, the bull being considered fully capable until his ninth, and the cow until her thirteenth, year.

Working cattle are broken in at four, and remain fully fit for work during eight, years.

For fattening they are considered ripe at four, but are at their best when seven, years old.

HUNGARIAN BUTTER AND CHEESE MAKING.

The country consumes much milk and sweet cream, not so much butter being used for the table as in the United States. The people are very exacting as to the quality of these things, and use only sweet

butter. Lately the system of making butter from sweet milk by separators is becoming quite popular. Cheese is made after the method of Holland and Switzerland, the fat, half fat, and the cream sorts. I have not seen any cheese here of the character of our "Western Reserve" brand.

CATTLE CENSUS OF HUNGARY.

The proportion of cattle raised for the butcher and the dairy will be seen in the following statements, the natives being raised principally for the butcher, and the Red Spotted and the Brown nearly altogether for the dairy.

The census of 1881 showed:

	Per cent.
Native White cattle	60
Red Spotted	20
Brown cattle	16
Buffalo and crosses	10
	100

The following were the numbers of each and of all:

Native:	
Bulls	31,702
Cows	1,535,960
Young cattle	1,463,132
Oxen	1,033,720
Total	4,064,514
Red Spotted and Brown:	
Bulls	14,722
Cows	499,257
Young stock	404,124
Oxen	119,671
Total Red Spotted and Brown	1,037,774
Oxen of different races in fattening	115,286
Buffaloes	93,804
Grand total in census of 1881	5,311,378
Grand total in census of 1871	5,279,193
Increase in ten years	32,185

This seems to be and is, in fact, a very small increase for such a period in a country which is so well adapted for cattle raising, and to whose interest it is as much as I have pointed out. I believe, however, that the next census will show far more satisfactory results, since the systematic efforts have been begun only at the end of the last decade; but what is of more value, the results as to quality and the profits in consequence will prove undoubtedly more satisfactory.

I am informed that the larger proportion of the above increase has been made in the dairy branch, and it is anticipated that this interest will nearly double in a few years.

IMPORTS OF CATTLE INTO HUNGARY.

Hungary is able to raise and is raising all the cattle needed at home for any purpose, and produces a surplus in cattle for the butcher. In consequence, there is nothing imported but the animals for breeding purposes, and these, as I have shown, come nearly altogether from the

yrol and Switzerland. Besides this, the territory is usually barred gainst the countries to the south and east, Servia and Roumania, hich are the only states also having a practical surplus. This prohibi- on is in consequence of certain cattle diseases frequently occurring here.

IMPORTS OF CANNED BEEF FROM THE UNITED STATES.

Specially from the United States the only article imported connected vith this branch is canned beef but this in such small quantities that t hardly deserves being recorded, and I do not anticipate that the im- ort from the United States will assume larger proportions or be of ny other character.

EXPORTS OF HUNGARIAN MEATS AND MEAT CATTLE.

The export of the surplus of Hungary meets with similar difficulties in the direction of Germany as that of the United States, experiences with the products of swine. Germany seems to be as much afraid of Hungarian cattle diseases as of the "dreaded American trichinæ." Shipments of live cattle to Germany are therefore prohibited. The only practical outlet is Austria and its provinces; but to show how "protection" is becoming the "parole" all over Europe, I may mention that though perfect free trade exists within Austria-Hungary, both be- ing within one and the same customs district, the former state has lately made quite a serious attempt to exclude the cattle of the latter; the attempt, however, has failed, and I will therefore not go further into the details of it.

Italy is open to Hungarian cattle and beef, but seems to find them too good or too dear for her demands.

Repeated efforts have been made to export dressed beef in refrigator cars to France (Paris), but the obstructions and difficulties proved too great and the ventures failed. For veterinary, sanitary reasons (?) Germany would not allow dressed beef to pass through its territory (somewhat as she objects of late to American pork passing through in transit). The beef therefore had to be taken by the roundabout way through Northern Italy, which proved too tedious, and I suppose too ex- pensive to make the undertaking practical or profitable. During the coming summer the new Arlberg tunnel route will be opened, and this, it is hoped, will give a more direct route to France and, at the same time, make Switzerland a possible field of export.

Hungary and Austria, belonging as stated to one and the same cus- toms district, there is no official statistics kept of the interstate trade, the exact number of cattle shipped from the one to the other is there- fore not known. The railroads show that during 1883 there were 183,000 head of cattle shipped from Hungary to Austria; nearly half of this number went to Vienna alone. Of course, many were taken across the border on foot, but there is no record of these. Many of the cattle thus taken to Austria, outside of the larger cities, are work-oxen, a good pair of such being worth about $200 to $220.

HEALTHINESS OF HUNGARIAN CATTLE.

The cattle of the Hungarian race are peculiarly free from disease, and the experience of many years has proven more particularly that the oriental cattle plague, though it is at home at no great distance to

the south and east of Hungary, never occurs spontaneously amongst the Hungarian cattle. Serious losses to large herds never occur here, like those frequently caused in other countries by lung and other diseases.

The "antrax" and "traumatic affections" are the only diseases from which the cattle suffer occasionally, but serious losses never follow in consequence.

COST OF TRANSPORTATION TO THE UNITED STATES.

Buda-Pesth not being a sea-port, made it impracticable for me to gain the information as to the expenses connected with a probable shipment to the United States.

For superintendence of or the looking after such shipment while in transit the expense will not be excessive. Experienced people *here* would, no doubt, be glad to have such an opportunity to go to the United States cheaply, and would probably be satisfied with the compensation of simply having their passage paid.

ROUTES OF EXPORT TO THE UNITED STATES.

The most practical route to ship, because the most direct, would be via Hamburg or Bremen, but it is a question whether Germany would permit such transportation through its territory. She may, however, be induced to make an exception when it can be shown that such *shipment* does not mean competition for any of her established fields of export.

Another route would be via Fiume or Trieste on the Adriatic. This, however, would involve an overlong sea-voyage for cattle. There remains the route through Northern Italy to France and one of the latter's sea-ports, or, what would make these still more practical, the route to France via the "Arlberg tunnel" and Switzerland.

OUTLOOK FOR CATTLE-RAISING IN HUNGARY.

In resumption I may give it as my conviction that in the near future Hungary will become a more important factor of Europe in the way of meat and dairy product supplies. Her central position and peculiar adaptation for stock-raising should have made her this long ago; but it is only of late that she has become fully aware of the importance of this interest or industry to the state, not only on account of its higher profitableness but also for other reasons, as I have shown at the beginning of my report.

I must say again, however, not only the people but also the government of the state are working in the most commendable manner towards a practical reconstruction of its resources, and they will no doubt succeed as much as earnest and practical efforts are deserving of success.

HENRY STERNE,
Consul.

UNITED STATES CONSULATE,
Buda-Pesth, April 16, 1884.

Special statistics concerning cattle in Hungary.

Race.	Height at maturity.			Live-weight at maturity.			Color.
	Cow.	Ox.	Bull.	Cow.	Ox.	Bull.	
	Meters.	*Meters.*	*Meters.*	*Lbs.*	*Lbs.*	*Lbs.*	
Hungarian cattle, "White cattle," "Podolian race."	1.55	1.66	1.55	1,215	*1,260	1,381	Light gray and white.
Red Spotted	1.46	1.53	1.52	1,249	1,392	1,878	Red spotted.
Brown cattle, "Brachiceros"	1.22	1.27	1.28	950	1,105	1,459	Badger-gray colored.
Pinzgauer	1.30	1.55	1.36	990	1,469	1,436	Red-spotted, dark.
Marienhofer	1.43	1.52	1.50	1,171	1,282	1,618	Light cream colored.
Buffalo	1.38	1.45	1.39	1,149	1,304	1,193	Black.

Race.	Weight of meat at maturity.†	Age at maturity.	How long bred purely.	Average quantity of milk per year.‡	Milk contains fat.
	Per cent.	*Years.*		*Gallons.*	*Per cent.*
Hungarian cattle, "White cattle," "Podolian race."	58.8 to 66.6	4	Always	180	7.56
Red Spotted	56.7 to 64.0	2½ to 3	Several centuries.	405 to 517	4.30 to 6.41
Brown cattle, "Brachiceros"	53.2 64.8	3 3½	Always	440 550	3.35 4.66
Pinzgauer	52.0 60.9	3 3½	Since 1740	380 495	3.89 6.11
Marienhofer	53.3 62.5	2 3	Since 1728	334 404	3.61 4.49
Buffalo	51.0 59.0	4	Always	190 214	

Race.	Milk contains cheese fat.	Total result of the products.					Remarks.
		Labor.	Net meat.§	Milk.‖	Butter.	Cheese.	
	Pr.ct.	*Yrs.*	*Pr.ct.*	*Galls.*	*Pounds.*	*Lbs.*	
Hungarian cattle, "White cattle," "Podolian race."	5.63	8	60.2	180	133	212	Description in text.
Red Spotted	4.35	3	60.3	460	208 to 247	442	Long, deep, heavy cattle with coarse bones.
Brown cattle, "Brachiceros"	3.81	4	59.0	494	195 221	442	Strong but not coarse bones.
Pinzgauer	4.17	4	57.0	438	182 206	347	Strong bones, and choice as to quality of food.
Marienhofer	4.18	3½	57.9	369	144	217	Tender animals, producing very heavy oxen.
Buffalo	.....	7	54.0	206	.....	.....	Description in text.

* In working condition.
† Percentage of gross weight, including some tallow in the outside weights, the inside weights for unfattened, good-conditioned animals.
‡ Calculated for three hundred days of milking.
§ Net weight of meat by per cent. from gross weight.
‖ Supposed total of year of three hundred milking days.

Special statistics concerning cattle in Hungary—Continued.

No.	Origin of the race.	Conditions of temperature.				Sorts of grasses, &c.		
		Degrees cold in winter.	Degrees heat in summer.	Average temperature for the year.	Number of feet above sea-level.	Clover.	Timothy.	Lucern.
1	Hungarian cattle, native of Hungary	*14 to †0	27 to 93	6½ to 46	300 to 1,500	1	1	1
2	Simmenthaler, native of Switzerland	*14 to †0	22½ to 83	5½ to 45	500 to 3,000	1	1	.....
3	Brown cattle, native of Bavaria	*14½ to †−1	17½ to 71	4 to 45	400 to 4,000	1	.....	.....
4	Red Spotted, native of the Tyrol	*16 to †−5	24 to 86	5½ to 45	350 to 4,000	1	1	.....
5	Cream-colored, native of Styria	.....	.....	.....	500 to 1,200	1	1	.....
6	Buffalo, native of Egypt	.....	.....	.....	.....	1	1	1

No.	Topography.		Character of the soil.				Substratum.					Remarks.
	Dry or damp.	Flat or hilly.	Alluvial.	Sandy.	Clay.	Peat.	Limestone.	Sandstone.	Granite.	Gravel.	Clay.	
1	Dry	Flat and hilly	1	1	1	....	1	1	....	1	1	Does not do so well on granite.
2	Damp	Mountainous	1	....	1	....	1	....	....	....	1	Does best where indicated "1."
3	....do	....do	....	....	1	1	1	....	1	....	....	Practical for high locations.
4	....do	....do	....	....	1	1	1	....	1	....	1	Does specially well on chalky soil.
5	....do	Hilly	1	....	1	....	....	....	....	....	1	Results obtained not so favorable.
6	Damp and dry	Flat and hilly	1	....	1	....	....	....	....	....	1	

*Reaumur. †Fahrenheit.

Best results have been reached where marked "1."

Detailed weights of the different parts of animals of the Hungarian race of cattle.

Parts.	Cow.		Medium conditioned ox.		Large well-fattened ox.	
	Pounds.	*Per cent.*	*Pounds.*	*Per cent.*	*Pounds.*	*Per cent.*
Live weight	784	.....	1,160	.....	1,774	.....
Skin and horns	56	7.18	88	7.61	104	5.87
Blood saved	33	4.22	38	3.23	42	2.40
Stomach and contents	81	10.28	191	16.47	197	10.80
Udder with contents	80	10.14	.....	.....	.....	.....
Feet and mouth	14	1.80	21	1.80	24	1.37
Tallow	64	8.15	106	9.17	212	11.96
Fore-quarter with one-half head	62	8.12	105	9.09	213	11.95
Hind-quarter	96	12.52	147	12.66	239	13.54
Remaining two quarters	159	20.00	252	21.90	451	25.90
Breast	48	6.05	75	6.47	140	7.90
Heart, liver, kidneys, spleen, and tongue	27	3.38	38	3.23	51	2.61
Loss by blood, &c	26	3.38	35	2.85	33	1.86
Entrails and lung	38	4.78	64	5.52	69	3.87
Total sum	784	100.00	1,160	100.00	1,774	100.00

DOMINION OF CANADA.

PROVINCE OF ONTARIO.

OPERATIONS OF CANADIAN CATTLE COMPANIES IN THE UNITED STATES.

REPORT BY CONSUL PARKER, OF SHERBROOKE.

The Cochrane Cattle Company, of which Hon. Mr. Cochrane, of the Hill Hurst Farm, Compton, is the president, owns very extensive grass lands near the Rocky Mountains in the British Northwest, where the company is breeding and grazing large numbers of cattle. With these herds the managers are now using Polled Angus and Hereford bulls to produce the best crosses with the native stock, and grades of Shorthorn and native parentage, which constitute the base of the herds. Experience has established it as a fact, they think, that the grade cattle produced by this crossing of the Aberdeens and Herefords with the rank and file of the herds, endure the rigors of the climate better and fatten more easily than any grades that they have been heretofore able to secure. The Dominion Cattle Company now has a lease from the Cherokee Indians of 284,000 acres of pasture lands, and also of a large body of land near the former in the Pan Handle of Texas. Upon these lands the company has located forty thousand head of cattle, mostly grades of native Texas and Shorthorn parentage, and not a few of them the children of second crossings of these grades with Shorthorn sires. The managers say that this continued crossing of grades of Shorthorn and Texan extraction with Shorthorns produces coarseness and legginess to an extent that renders the cattle harder to fatten and slower to mature. That, in short, the third or fourth generations produced by that kind of crossing will not become sufficiently fat for butcher's use upon grass alone, and that herdsmen who have followed that line of crossing persistently are now only able to sell cattle to the feeders. To correct this tendency Polled Angus and Hereford bulls have been introduced, and the results in the herds of the Dominion Cattle Company give promise of being highly satisfactory.

The methods of this company are perhaps worthy of a short digression from the main subject in hand. It occupies a breeding farm of 7,000 acres, near Emporia, Kans., which is used not only to breed the best lines of pure blooded cattle, but also to thoroughly acclimate imported stock before it is sent forward to the herds. To this farm the thoroughbred stock from Cookshire and other Canadian breeding establishments, and the imported cattle from Scotland and England, after coming from the ninety days' quarantine at Point Levi, are sent in the autumn, and remaining there over winter, are supplied to the herds in the spring. Thus an effectual quarantine of seven to eight months is provided against the possibility of sending diseased animals to the herds. For first crosses with native cattle in the West and South nothing is superior to the Shorthorns. But for additional crosses the hardihood, compactness, and beefiness of the Aberdeens and Herefords greatly commend

them. Another point in their favor is that they are what herdsmen call "good rustlers;" that is to say that they are active feeders and will find the grasses and assimilate them with a readiness that makes them superior for grazing cattle to most other breeds.

The growing favor with which these cattle are received by breeders in the United States indicates that they regard them much in the same light in which they are looked upon by the Canadian breeders. Sales were made during the past fall from two eastern township herds. One by Mr. Cochrane, in Chicago, from the Hill Hurst Farm herd, of sixty Polled Angus bulls and heifers, all of which brought prices that appear almost extravagant, and the other by W. B. Ives from the Cookshire herd. This latter took place in Kansas City, Mo., where forty Polled Angus bulls and heifers were sold at prices which averaged $540 each.

BENJ. S. PARKER,
Consul.

UNITED STATES CONSULATE,
Sherbrooke, December 19, 1885.

THE MOST SUITABLE CATTLE FOR CANADIAN FARMERS.

REPORT BY COMMERCIAL AGENT ROBBINS, OF OTTAWA.

As indicating the extent of cattle-raising in Ontario, the latest census report shows that there were 160,207 killed or sold during the year 1880, and that there were 23,263 working oxen, 782,243 milch cows, and 896,661 other horned cattle in the province. Many of the better grades of fat cattle are exported to England, and considerable attention is being given to the improvement of stock for this market, whilst most of the stock cattle are marketed in the United States; large numbers going to the sections bordering on the Saint Lawrence. The class exported to the States are mostly of the native or Canadian breed, and with the change of feed and care prove profitable for both beef and dairying purposes.

THE SHORTHORN AND THE HEREFORD.

In 1880, by an order in council, a committee of eighteen prominent citizens of Canada was appointed to investigate the various agricultural interests of Ontario, and was known as the Ontario agricultural commission. A large amount of testimony was taken, especially on the cattle question, and in February 1881, their report was completed. I herewith submit as a part of this report an extract embracing the conclusions arrived at by the commission, as follows:

The evidence obtained as to the qualities of the Polled Angus, more particularly as beefing cattle; the proofs of the success they have achieved in the prize ring, and the estimation in which they are held by the British salesman and butcher, give them the strongest claims to attention by Ontario breeders.

The statements as to the size, weight, and early maturing, as well as extraordinary milking qualities said to belong to the Holsteins, commend them also to closer observation and strict scrutiny.

Coming to the breeds more familiar to the farmers of this province it is clear to every one that for general use, and for the combination of beefing and milking qualities, the Jerseys are not to be thought of. They must be regarded as useful for their own particular and pacific purpose of yielding a copious supply of very rich milk, and as suited exclusively to butter-dairying purposes or for private family use.

The Ayrshires have a far closer relationship to the common cattle or natives than the Jerseys, possibly than any other breeds, although that is an open question. And the Ayrshire bulls may be found of service in maintaining and perpetuating or reviving the functions where they appear to have fallen off or to be declining. The Ayrshires can be brought to a fair size for market, and, some tendency to milk fever excepted, owing to the great activity of their milking functions, are a hardy and thrifty race of cattle. But it is impossible to say that they are the breed to which the general farmer can look for the means of putting his herd on the most profitable and economical footing.

The Galloways have the merit of being good beefing cattle if well fed, and of enduring hard fare if such be their fate. They may, also, from the absence of horns, be a little better adapted for a shipping trade than others. But they take no high place as milkers, unless it be in isolated instances, and in the presence of the Durham and Hereford it is not possible to say they are the breed on which the ordinary farmer should place reliance. There may, however, be situations in so wide a country as Ontario, not to say Canada, where the hardiness of the Galloway would make it of value.

The Devons as draft-cattle, and rich if not very copious milkers, may suit those who have special need of animals possessing such qualities, while for the home market they produce meat of a rich and excellent quality; but as a breed to furnish the grade steer or heifer needed by the Ontario shipper they will never, it may safely be predicted, take a high place.

The fact is, that for the object the commissioners have in view, namely, the several combined requirements of the Ontario farmer, the competition for first place lies between the Durham and Hereford alone. Of either of these two noble breeds there are a sufficient number in Ontario to supply the ordinary demand, although the Durhams being the most numerous the opportunity for selection by buyers is greater, and the services of Durham male animals can be as a rule most easily secured.

For attaining a given size and weight in a given time and at the earliest period of its life, always assuming its treatment to be liberal and judicious, the Durham cannot be beaten. The prepotency, too, of the Durham male is universally recognized, and there is enough Durham blood in most of the present farm stock of Canada to make assimilation easy and to secure certain results. By careful selection, too, of bulls from milking families the dairyman may secure in the Durham the means of beefing his cows profitably when needful to do, without diminishing the supply of the milk on which he primarily depends for his profits. The only danger, if there be danger, in the Durham, is that by too close breeding, and perhaps pampering, a delicacy of constitution may be engendered and disseminated. Such a possibility has been hinted at, and while it ought not to tell for one moment against the use of the Durhams at the present time, it makes it all important (1) that no opportunity should be lost of giving the Durham stock in Ontario the benefit of imported blood; (2) that the intelligence and vigilance of breeders and veterinary surgeons should always be on guard against such a possibility; (3) that the knife should be used unsparingly when anything short of the most vigorous constitution is detected, and (4) that all legitimate encouragement should be given to a second breed of cattle capable, approximately, of holding its own against the renowned Shorthorn.

That breed, so far as Ontario is at present concerned is, if the evidence be correct, the Hereford. Strong in its prepotency, all but equal in early maturity in the stall, and more than equal in the pasture to the Durham; with a constitution in which, so far, no trace of or tendency to any weakness has been detected and with good milking qualities, the Hereford may yet prove to be a useful factor in the great work of giving to Ontario a class of cattle adapted to the varied demands of such a country.

THE NATIVE CATTLE OF CANADA.

The foregoing conclusions are based upon a large amount of testimony given by prominent cattle-growers before the commission, and representing all portions of the province. I would also in this connection call attention to the common grade of cattle, which are said to have considerable merit for beefing and dairying purposes.

Prof. W. Brown of the agricultural college at Guelph, in a report to the Agricultural Association of Ontario, in 1882, says:

The Canadian: I know of no class of cattle so well deserving a first-class notice in these pages as the Canadian. There is a distinct type entitled to this name. I do not mean those with a touch of the Ayrshire, Devon, or any others, not even the Shorthorn grade; but that moderate sized, milking, wiry, active stamp well known to the average farmer. I claim that the Canadian deserves more notice than has ever

been given to it, public and specific; given a recognized position that cannot be doubted. Our experience of this breed has been intimate and very satisfactory. We hold by clear and substantial evidence for eight years that the Canadian cow takes no mean place as a milker, a mother, and a field for wide work both for beef and dairy purposes. Much of this is due to her distinct character in more respects than one. She is decidedly content with her average circumstances, miserable as they be at times; can do as well in the bush as in the clover fields, and responds with her best when the thermometer is at zero or 90° in the shade. Her quantity of milk is not so large as the Ayrshire for six weeks after calving, but far ahead in continuance, and therefore on an average equal; in cream it is unquestionably superior to the Ayrshire. No one well acquainted with the breeds would choose the Ayrshire against the Canadian where hardships and profits, under ordinary conditions, were elements; so also in regard to a common source for cheap production of beef with Shorthorn or Hereford bull; other bulls have not as yet been sufficiently tried except the Ayrshire and Devon, which cannot compare with these two. While small as a heifer, the Canadian cow is roomy as a breeder, and this affords field enough for such purpose. I am confident that a proper selection of the milking Canadian would add immensely to the dairy and beefing interests of the country.

It is also in evidence that the farmers of Canada, do not as a rule, take the best of care of their stock. Mr. John Clay jr., a witness before the commission, speaks very strongly on this subject, he says:

I believe my remark about the farmers badly housing and feeding their cattle in the winter applies generally to farmers in Canada. Their buildings are as a rule drafty and cold, and the amount of food they give to their cattle is not enough to keep up their frames. This practice is very general throughout Canada. Although you will find some of our farmers who keep their cattle in very good condition, I believe the percentage of farmers in Canada who neglect the proper feeding and housing of their cattle is fully 60 per cent.

R. B. ROBBINS,
Commercial Agent.

UNITED STATES COMMERCIAL AGENCY,
Ottawa, October 3, 1885.

CATTLE AND DAIRY FARMING IN ONTARIO.

REPORT OF CONSUL PAGE, OF PORT SARNIA.

THE NATIVE CATTLE BRED OUT.

In compliance with Department circular, under date of July 18, 1883, I send herewith such information as I have been able to obtain (by actual observation and otherwise) touching the breeding of cattle in Canada. For a number of years back the Canadian farmer has shown commendable zeal and much good judgment in the direction of the improvement of his cattle. By crossing the native cattle with imported breeds from Europe the old style of ox and cow have nearly disappeared from the pastures, the distinctive features of the Shorthorn, the Galloway, the Hereford, the Ayrshire, and other breeds are clearly observable in the various farm-yards of Ontario, and in many sections of this province purely native cattle would be regarded as a curiosity.

CANADIAN POLLED ANGUS CATTLE.

On the 30th of October last I visited the stock farm of the Messrs. Geary Bros., near London, and through the courtesy of Mr. John Geary I was shown the splendid herd of Polled Angus cattle owned by his firm. I saw in one inclosure, arranged in such a manner as to be seen

from every part of the building, one hundred head of these peculiar cattle, some of which were imported direct from Scotland by the Messrs. Geary, and others were bred from imported stock on the farm where I saw them. In color they are intensely black; they have no horns, are short-legged, heavy-bodied, with small bone, and in appearance they were very healthy. They are good feeders and very docile and hardy. I am informed that when a number of these cattle are turned out to pasture, that they do not scatter over the field as do other breeds, but are usually found feeding close together like geese or sheep. The beef from the Polled Angus ox is said to be of excellent flavor, and the different layers of lean and fat are distributed in such a manner as to resemble variegated marble, and in the market it is frequently designated as marble beef. From careful inquiry in relation to the characteristics of this breed of cattle, I am convinced that they would be a source of profit to the farmers of our Northern and Middle States; of one thing I am certain, the animals of this breed are in appearance much improved by the transition from Scotland to Canada, or rather, the animals bred in Canada from imported Polled Angus stock are superior in size and general appearance to the cattle from which they were bred. Some fine specimens of this stock were recently sent from the farm of Geary Bros. to Kansas, and Mr. John Geary informed me that he frequently receives orders by mail from various points in the United States for animals of certain weight and other characteristics to suit the purchaser, and he volunteered a compliment to the American buyer by the remark that in filling these orders, as he invariably did (he possessed suitable stock for the purpose), he had always received a ready response by way of draft or otherwise from the purchaser in full payment as soon as the animal had reached its destination.

The following extract in reference to the Polled Angus I take from the report of the Ontario agricultural commission for 1881:

> The victories won by the Polled Aberdeens in the prize ring would be too numerous to recapitulate here. Suffice it to say it was a Polled Angus bullock that carried off Prince Albert's cup at Poissy in 1862, the competition being between all the breeders of the world; that a Polled Angus yearling bull won the gold medal of his class, at Paris, in 1878; that a Polled Angus has repeatedly gained the chief prizes at Birmingham, and carried off the champion cup on at least three occasions at the Christmas cattle-show in London, the last of these triumphs being at the show for 1880. The Tillyfour herd now exists no longer. On the 26th of last August it was sold by auction and dispersed. The accompanying plate supplies a very excellent illustration of the Polled Angus breed, of which some very fine animals are to be seen at the agricultural and model farm at Guelph.

Professor Brown says of these Aberdeen Polled cattle:

> I am very well acquainted with the Aberdeen Polled, and it is well known that for early maturing it is equal to the Shorthorn, though not so far as our experience goes equal to it in improving other breeds or in attaining a greater weight in a certain time. At the present time we may call them our second best beefing breed.

But in the eye of the British buyer of fat cattle Polled Angus does not rank second even to the great Shorthorn. Mr. Hall, in his evidence, says:

> Of the cattle which come into the English market those which rank highest in point of quality are the Aberdeen Scot. They are the breed known as the Polled Angus. The fat Galloway ranks about equal with the Polled Angus; but a middling Galloway is just about as bad a bullock for a butcher as you can select; he kills very coarse indeed. The Galloway will bring more per pound than any other breed, except the Aberdeen, but he does not cut as streaky as the Polled Angus. * * * Next to the Polled Angus or Scot in point of quality I put the English Shorthorn or Durham.

Mr. Hall adds further on:

For the purpose of getting good grades I would recommend your farmers to cross your native cattle with Shorthorn, and only to cross once. I would also recommend the Polled Angus as an animal for improving your stock; I think the Polled Angus crossed with the Shorthorn would give you an excellent animal for the butchers—that is, one cross. I would take a thoroughbred Shorthorn cow and cross her with a Polled Angus bull. I would also cross the Polled Angus with your native cows. I do not think thoroughbred steers sent over to England would fetch any more than other cattle. Whether you would succeed in making anything better than a Shorthorn I would not venture to say, because you have sent some extraordinary cattle into England.

The evident merit of the Polled Angus breed (writes the secretary of the Ontario agricultural commission) has induced the commissioners to notice them quite fully. One writer says, with reference to crossing the Polled Angus with the Shorthorn:

It is probable that the size of the Shorthorn would be somewhat reduced, which might not be a disadvantage, but his quality would not be impaired; indeed there can hardly be a doubt that the quality of the meat would be improved. On this *point*, however, we are not left to reason or conjecture, for the cross has been tried with most happy results. A distinguished Scotch authority says: "Of all the varieties of cross-bred cattle there is none more satisfactory or remunerative than the Polled Angus, or Aberdeen, and the Shorthorn. It grows to a large size, shows great aptitude to fatten, and when killed the fat and lean are found to be distributed throughout in the most desirable proportions.

My object in making special mention in the present report to the Polled Angus breed is to call the attention of the American stock-breeder to a breed of cattle having many excellent qualities, and a breed, too (as compared with many other kinds and qualities of cattle), of which but little is known.

NUMBER AND BREEDS OF BLOODED CATTLE IN ONTARIO.

By reference to the following table it will be observed that for the year ending May 31, 1882 (which is the last available information *upon* this point), there were but two hundred and seventy head of Polled Angus cattle in this province:

Number of each class of thoroughbred cattle in Ontario, by county municipalities, as returned May 31, 1882.

Counties.	Thoroughbred cattle.						
	Durham.	Devon.	Hereford.	Polled Angus.	Galloway.	Ayrshire.	Total.
Essex	246	34	33	25	17	79	434
Kent	391	32	41	1	37	48	550
Elgin	321	67	13	19	24	54	498
Norfolk	433	60	46	5	50	130	724
Haldimand	394	23	16	.....	46	11	490
Welland	190	37	9	3	14	28	281
Lambton	488	71	8	5	24	54	650
Huron	688	60	36	23	40	136	983
Bruce	496	33	32	8	41	89	699
Grey	507	42	35	6	51	37	678
Simcoe	587	51	28	7	54	67	794
Middlesex	1,111	151	50	14	65	77	1,468
Oxford	648	51	19	5	24	166	913
Brant	591	8	8	.....	10	16	633
Perth	433	30	7	10	23	48	551
Wellington	1,125	86	125	9	77	52	1,474
Waterloo	670	13	18	6	5	42	754
Dufferin	139	8	7	9	12	9	184
Lincoln	272	24	5	.....	34	5	340
Wentworth	316	30	10	2	9	119	486
Halton	429	37	1	1	13	49	529

Number of each class of thoroughbred cattle in Ontario, &c.—Continued.

Counties.	Thoroughbred cattle.						
	Durham.	Devon.	Hereford.	Polled Angus.	Galloway.	Ayrshire.	Total.
Peel	462	36	11	.....	23	30	562
York	741	27	22	4	27	127	948
Ontario	767	33	6	.....	24	17	847
Durham	457	52	21	6	35	88	659
Northumberland	328	45	12	4	28	121	538
Prince Edward	142	13	14	1	32	173	375
Lennox and Addington	151	29	2	2	25	117	326
Frontenac	158	7	10	6	31	123	335
Leeds and Grenville	289	18	17	7	32	545	908
Dundas	106	17	22	5	39	263	452
Stormont	85	23	8	9	15	307	447
Glengarry	133	26	40	6	3	293	501
Prescott	89	5	25	5	3	202	329
Russell	69	5	2	4	2	79	161
Carleton	127	10	11	2	26	129	331
Renfrew	70	9	1	.....	10	93	183
Lanark	109	2	5	10	21	140	287
Victoria	193	55	13	2	12	31	306
Peterborough	173	46	87	2	33	86	427
Haliburton	15	3	.....	2	4	5	29
Hastings	176	48	16	27	27	202	496
Algoma	17	1	1	.....	2	5	26
Muskoka	38	20	3	1	4	2	68
Parry Sound	25	4	.....	7	2	2	40
Total	15,385	1,438	841	270	1,189	4,496	23,619

MILKING QUALITIES OF THE POLLED ANGUS.

With regard to the milking qualities of the Polled Angus, my observation does not lead me to speak authoritatively. On this point I may quote Lord Airlie, of Scotland, the owner of a herd of Polled Angus cattle. In his reply to a writer in North British Agriculturist he says:

I observe that the writer of the article states that the Polled Angus cows are bad milkers. It is the fashion to say so; and no doubt, if you breed exclusively for show-yard purposes and for beef producing, you may have a number of indifferent milkers. The same might probably be said of any herd, certainly of the Shorthorns. But if you want dairy cows, and select the right animals, you will have nothing to complain of.

He further says:

I have at present seventeen Polled Angus cows in my dairy. The greater number of these give from 12 to 14, and sometimes 16 Scotch pints for a considerable time after calving.

The milk is admitted to be much richer than that of either the Shorthorn or Ayrshire. As regards the length of time for which they will continue to give milk, Lord Airlie says:

My cow, Belle of Airlie (1959), dam of Belus (749), as pure a Polled Angus as any in the herd-book, used to be milked all the year round.

TRANSPORTATION OF STOCK TO THE UNITED STATES.

By a glance at the map of Ontario, it will be seen that nearly every township in the province is in close proximity to a railroad. The Grand Trunk and Canada Southern with their numerous branches, furnish excellent means for the transportation of stock. These roads connect at both the eastern and western frontiers of Ontario with the various American lines which lead to every State and Territory of the United States. Of course the cost of transportation depends upon the distance.

The rate per mile for both freight and passengers by Canadian railways is about the same as that charged by the railroads in the United States. The competing lines of railway in this province may be regarded as a sufficient guarantee against an overcharge in the item of freight.

FEEDING AND HOUSING CATTLE IN ONTARIO.

As to housing cattle, all stock breeders agree in recommending warm and well ventilated stables. There are different kinds of stables, but the most convenient method appears to locate the stalls in a large and roomy stone basement. The cattle are usually tied with chains fastened to a collar of leather which encircles the neck, the animals facing each other with an alleyway between them. Corn fodder, or green unmatured cornstalks, is a favorite food for cows, and is freely fed to milch cows during the last weeks of July and the month of August. This food, *it is* claimed, keeps up a steady flow of milk and keeps the animal in good condition. Canadian farmers cut their hay earlier than formerly, as they say grass allowed to shrivel and bleach in the sun and rain loses much of its nourishment; hay, to retain its sweetness, must be cut early and dried quickly in the sun.

CHEESE MAKING IN ONTARIO.

Previous to the year 1864 factory cheese-making had not been known in Canada. At about the date mentioned (as I learn from the *report of* the Ontario agricultural commission, Mr. Harry Farrington, of Herkimer County, New York, settled in Oxford County, Ontario. Mr. Farrington commenced the manufacture of cheese as he had previously done in New York State, and, to use the language of Mr. Ballantyne (a witness before the commission above referred to), "a deep debt of gratitude is due to Mr. Farrington for having established this new and thriving industry in Canada." To show the growth of this industry, I may be permitted to refer to the following figures: In 1857, 1858, and 1859, the exports of cheese from Canada to the United States—the reciprocity treaty being then in force—was 124 cwts., 117 cwts., and 323 cwts., respectively; in 1860, 1863, and 1864, 1,110 cwts., 466 cwts., and 1,138 cwts. The highest money value of cheese exports in any of the above years was $16,199. In 1879 and 1880, the exports of cheese from Canada amounted to no less than 43,441,112 pounds, the declared value being $4,094,046, or nearly 10 cents per pound. Of this, 40,368,678 pounds was the produce of Canada; 3,000,000 pounds of American cheese for the same period apparently found its way to a foreign market, through Canadian ports. The following table shows by counties the quantity of milk used, the quantity and value of cheese made, and the quantity of cheese on hand as returned for three hundred and six factories in December, 1882. Also the total number of factories in the province for the same year. It will be seen that whilst the returns show four hundred and seventy-one factories in Ontario, reports were received but from three hundred and six, leaving one hnndred and sixty-five factories in the province from which no returns were made for the year 1882:

County.	Factories.		Milk used.	Cheese made.	Value of cheese.	Cheese on hand.
	Total number.	Number making returns.				
			Pounds.	*Pounds.*		*Pounds.*
Kent	12	5	3,054,764	298,576	$32,070	.....
Elgin	25	13	12,164,698	1,171,984	125,720	.....
Norfolk	18	4	2,841,510	269,217	28,882	.....
Haldimand	5	5	3,183,446	318,344	5,917	.....
Welland	4	3	259,112	25,849	3,060	.....
Lambton	12	9	7,306,141	705,404	75,995	.....
Huron	16	11	12,232,175	1,190,212	132,110	401
Bruce	7	4	3,269,566	317,092	34,213	.....
Simcoe	6	2	525,000	52,500	5,322	.....
Middlesex	25	16	22,688,777	2,191,082	241,130	.....
Oxford	31	15	25,578,094	2,494,035	268,550	.....
Brant	7	2	1,970,522	191,475	21,712	.....
Perth	33	18	24,122,724	1,883,919	209,465	.....
Wellington	8	7	5,461,005	530,989	59,256	.....
Waterloo	8	8	6,860,290	630,328	66,529	324
Wentworth	3	3	4,165,804	402,141	40,097	5,486
Peel	3	2	1,901,204	164,220	17,073	50
York	3	2	356,340	34,142	3,934	.....
Ontario	5	2	644,308	53,812	6,935	.....
Durham	6	4	2,902,802	278,350	30,751	.....
Northumberland	19	13	12,423,333	1,228,751	133,853	.....
Prince Edward	10	7	3,466,800	642,648	37,326	.....
Lennox and Addington	10	10	8,454,817	820,295	80,700	.....
Frontenac	20	6	3,373,799	349,284	37,397	.....
Leeds and Grenville	49	27	19,138,414	1,823,329	197,775	3,762
Dundas	5	4	2,308,646	231,930	24,639	.....
Stormont	10	14	9,063,770	919,619	101,659	.....
Glengarry	43	42	26,000,000	2,600,000	300,000	.....
Lanark	8	5	4,109,440	411,591	43,973	2,229
Victoria	4	3	2,379,626	234,121	25,454	.....
Peterborough	9	8	5,684,132	558,731	60,202	.....
Hastings	31	27	24,415,660	2,492,857	271,861	.....
Other counties	16	5	3,445,946	341,098	34,975	.....
Total	471	306	265,813,755	25,502,431	2,767,065	12,342

The proportion of cream to milk from well-fed and well-kept cows of good breed is stated at from 14 to 16 per cent.; this is regarded as an average. When milk is exchanged at the factories for cheese (as is the custom in this country), the amount allowed is 1 pound of cheese for 10 pounds of milk.

TREATMENT OF DAIRY CATTLE.

In reference to the treatment of dairy cattle, I may say that a good, warm, well-ventilated stable, a liberal supply of food, and an abundance of fresh water, are indispensable; coupled with these kindness and gentleness of manner should ever be characteristics of the dairyman. I would urge (even at the risk of being considered sentimental) the practice of forbearance and kindness toward all domestic animals, in the first place because it is right and in the next place because it pays.

CLIMATE OF ONTARIO.

Although I have not been able to obtain such information as would enable me to fill out the forms sent me by the Department having reference to climate and other subjects, yet the annexed table will I trust be of interest as showing the comparative meteorological register for the seven years, 1876 to 1882, as recorded at the Toronto Observatory, in latitude 43° 39′ 4″ north and longitude 5h 17′ 33″ west.

Years.	Temperature.								Barometer.				
	Mean.	Difference from average (42 years)	Thermic anomaly (lat. 43° 40').	Highest.	Lowest.	Monthly and annual ranges.	Mean daily range.	Greatest daily range.	Mean height.	Difference from average (41 years).	Highest.	Lowest.	Monthly and annual ranges.
	°	°	°	°	°	°	°	°	°	°	°	°	°
1882	45.42	+1.21	−5.60	89.9	−17.4	107.3	15.70	36.0	29.6515	+.0353	30.447	28.783	1.664
1881	46.06	+1.85	−4.96	92.7	−15.1	107.8	16.61	40.9	29.6311	+.0149	30.461	28.811	1.650
1880	45.43	+1.22	−5.59	89.9	− 8.3	98.2	15.96	30.8	29.6359	+.0197	30.332	28.806	1.526
1879	44.16	−0.05	−6.86	89.5	− 8.9	98.4	17.10	34.1	29.6352	+.0191	30.319	28.948	1.371
1878	47.09	+2.88	−3.93	95.4	− 9.0	104.4	15.11	28.6	29.5647	−.0515	30.123	28.607	1.516
1877	46.10	+1.89	−4.92	88.8	−13.9	102.6	16.19	33.2	29.6346	+.0184	30.252	28.712	1.540
1876	43.98	−0.23	−7.04	92.9	− 9.5	102.4	15.68	42.1	29.6017	−.0146	30.250	28.700	1.547

Years.	Mean humidity of the air.	Mean elasticity of aqueous vapor.	Cloudiness.		Wind.			
			Mean.	Difference from average (28 years).	Resultant direction.	Resultant velocity.	Mean velocity (miles per hour).	Difference from average (34 years).
					°	°	°	°
1882	74	0.265	0.63	+0.02	N. 47 W.	2.11	10.43	+2.86
1881	75	0.283	0.62	+0.01	N. 50 W.	2.70	9.91	+2.35
1880	77	0.260	0.62	+0.01	S. 80 W.	2.86	10.54	+2.98
1879	76	0.267	0.63	+0.02	N. 72 W.	3.18	10.36	+2.80
1878	77	0.293	0.62	+0.01	N. 63 W.	2.25	8.32	+0.76
1877	74	0.275	0.60	−0.01	N. 62 W.	1.89	8.23	+0.67
1876	76	0.263	0.66	+0.06	N. 51 W.	1.96	9.29	+1.73

Years.	Rain.			Snow.			Number of fair days.	Number of auroras observed.	Possible to see aurora (number of nights).	Number of thunder-storms.	Number of hours sunshine.	Ratio of possible sunshine.
	Total amount.	Difference from average (39 years).	Number of days rain.	Total amount.	Difference from average (39 years).	Number of days of snow.						
1882	20.587	− 7.518	110	42.5	−27.42	62	209	60	204	28	2,169.5	4.47
1881	21.138	− 6.967	123	57.6	−12.32	64	191	23	187	24	.....	.....
1880	30.922	+ 2.817	140	44.0	−25.92	78	193	23	198	47	.....	.....
1879	22.515	− 5.500	170	60.5	− 1.42	79	188	9	191	37	.....	.....
1878	43.390	+15.285	182	51.0	−18.92	56	202	7	195	30	.....	.....
1877	21.885	− 6.220	116	37.3	−32.62	54	204	13	206	33	.....	.....
1876	21.063	− 7.042	117	113.4	+45.48	76	186	13	171	19	.....	.....

VALUE OF WEATHER REPORTS.

Farmers in this country are just beginning to appreciate the weather reports which are bulletined at the various telegraph stations, throughout the province, and this system, which gives with a reasonable degree of correctness information concerning the approach of storms, is particularly valuable during the season of harvest.

SAM'L D. PAGE,
Consul.

UNITED STATES CONSULATE,
Port Sarnia, November 17, 1883.

THE CATTLE OF ONTARIO.

REPORT BY CONSUL HOWARD, OF TORONTO.

HOW ONTARIO BECAME POSSESSED OF BLOODED CATTLE.

The province of Ontario was largely settled by sturdy well-to-do farmers from England and Scotland, who brought with them to their new home not only their native, social, and political peculiarities, but also the agricultural axioms and tenets of their fatherland. So that shortly there appeared in Canada a farm, here, that was a transcript, as far as the new locality and the changed conditions would permit, of the Scottish farm and surroundings; a farm there that was, as far as possible, a copy of the one that had been left in England. And in time cattle familiar to the eye of the settler, and of the sort that had been in a generous sense his friend "at home," came to be seen in the new fields and gave evidence not only of their owners' prosperity, but of that inherent sentiment that cherishes old associations—that delightful conservatism that clings to old friends. So the stately Durhams soon dignified the fields of the English emigrant and gladdened his eyes with their magnificent proportions, while the Ayrshire cow filled the Scotch farmer's heart with gladness and his pail with milk. And at one time the character of the herd—whether Durham or Ayrshire, Galloway or Devon—might almost have been determined by the name of the owner. This natural method of selection, if it may be called such, has not been without its lasting benefit. Through it there has been introduced into Canada a much wider variety of cattle than would otherwise have been the case—none of them adapted to all uses, of course, but each race excelling in some desirable quality. In later years national sentiments have ceased to govern cattle-breeding in so large a measure, and to-day cattle are bred for certain known and admitted excellencies, and the breeder selects his herd in accordance with the object in view—as stall feeding, grazing, the dairy, or family use.

THE CANADIAN SHORTHORN.

Of all the different breeds in Canada the one first deserving of notice, both by its superiority in numbers as well as its early introduction into the country, is the Durham, or Shorthorn, as it is much oftener called at the present day. The superiority of this breed of cattle for beef purposes was for many years unquestioned, and might, perhaps, be so still had not the art of Shorthorn breeding been turned from its legitimate line into unscientific and fatal courses. A kind of bucolic dilettanteism sprang up among breeders of this race of cattle, and in the development of family lines the general improvement of the race as a whole was almost entirely lost sight of. Starting undoubtedly with an honest desire on the part of the most skillful of the English breeders to perfect the Shorthorn race of cattle, their very success founded a royal family of Shorthorns so powerful in its influence that it may well be doubted if the *Duchess* family, *as a family*, have not done Shorthorn breeding more harm than good. The whole result of breeding in the years that followed the death of Mr. Bates, that most conscientious and intelligent of English breeders, was simply to produce and perpetuate a pedigree. Very soon the natural result of such a vicious system was seen in im-

potent bulls, barren cows not able to bring forth even a pedigree, weakened constitution, diminished size, but greater fineness of bone and that "thoroughbred look" that to many eyes compensated for the absence of the best marks of the earlier race and the plebian families. A pampered life, incestuous breeding, and a disregard of the true idea of development, brought the inevitable result of such a method. Though, fortunately, while the inherited weakness of the "royal family" kept its numbers small, the scarcity kept the prices up, and therefore in two ways prevented the average breeder from the folly of buying a pedigree with a bull "thrown in," and allowed him to go on with the development of his "plain" bred cattle, according to common sense and yet truly scientific principles. I judge the evil, however, to have been less in Canada than in the United States, for the Canadian farmers, in a certain sense, had inherited the Shorthorn idea, and have not swerved from it in any material degree. They had a natural eye for a "beef critter," and that, together perhaps with the inability to pay $3[illegible],000 for a six-months' heifer, kept them in the more legitimate paths of improvement. During all this time it is to be observed that the Shorthorn, among all other beef breeds, was "*facile primus.*" If then, as now, other breeds of cattle had been pushing the Shorthorn to the wall and making that race fight for its honors, it is safe to say that the breeders of this magnificent race of cattle would have been saved from the folly of attempting to ennoble a single family by false and unscientific methods at the expense of the rest of the race. The danger from this cause is now, fortunately, passed, probably never to return, for the other beef breeds—the Herefords, the Aberdeens, and the Galloways—are pressing the Shorthorn so hard for their honors that the breeders of the latter animal have no time to waste in looking for a better rule of breeding than "the selection of the fittest." The Shorthorns were among the first pure-bred animals to be introduced into the province, and they have held their predominance in numbers to the present time. Professor Brown, of the Ontario Agricultural College, to whom I am largely indebted for the materials for this report, says there are three hundred and fifty herds of pure-bred cattle of all classes in the province of Ontario, and of the total number of pure-bred bulls nine-tenths, and of the total number of pure-bred cows six-sevenths, are Shorthorns. The preponderance of this breed may also be seen from the fact that at the fat stock show held in this city December 14 and 15, 1883, there was no animals shown except Shorthorns and their grades. The earliest herds to be established in this province were those of Messrs. F. W. Stone, John Snell & Sons, James J. Wright, James Cowan, and William Douglass during the years 1853, '54, '55, since which time Shorthorn herds have become widely extended, the principal ones being in the counties of Wellington, Brant, Middlesex, Waterloo, Ontario, Perth, York, Oxford, Bothwell, Simcoe, Huron, and Bruce. As a race of cattle the Shorthorns are generally admitted to be superior for stall-feeding purposes, maturing early and taking on flesh evenly and rapidly. I have given at the close of this report some figures bearing upon this subject derived from the fat stock show, to which reference has already been made. I was present at the Toronto Industrial Exhibition, last September, when there was a large display of Shorthorn cattle of all ages and representing a wide extent of the province. It was a very creditable display indeed, and one that would have been difficult to excel anywhere. But while equally good animals could probably be found in the United States I am of the opinion that the prices here are considerably lower than with us. I quote at considerable length the

eport from the agricultural college of Ontario concerning the Shorthorns on the college farm:

We can speak highly of the milking properties, in quantity and quality, of the ost of our cows of this breed—making good calves or reliable milkers, as the case ay have been. We have nothing to say against the sure breeding of the cows, but ur four bulls in these years have not given satisfaction in this respect. Without exeption they have caused delay, loss, trouble, and extra expense, why, I am not preared to say; two were imported and two Canadian bred; none were ever in such high lesh as those of some other breeds. If 'tis said the choice of individual bulls was bad, hen the reply is that three independent judges did so; if management by want of ractical knowledge is charged, then the same management had to do with the other ulls that have stood so well. If the Shorthorn requires on an average more drawng-room attention than other beefing breeds, then it had better be acknowledged at once, and I don't think their admirers need be ashamed of the fact. We have fattened Shorthorn grades, Hereford grades, Devon grades, Ayrshire grades, and Galloway grades for beef both in the stall and on pasture, and nothing equals the Shorthorn in giving that stamp to produce weight in the shortest time on *Ontario conditions*—growth of youth on good pasture and finishing in the stall.

THE CANADIAN AYRSHIRE.

In the report of the Agricultural and Arts Association of Ontario for the year 1882 the number of Ayrshire cows in the province is estimated at three hundred and bulls at one hundred, scattered through the counties of York, Ontario, Simcoe, Peel, Halton, Wentworth, Frontenac, Lanark, Carlton, Russell, and Prescott, with a few in Oxford and Northumberland. The Ayrshire cow has long been famous the world over for an enormous yield of milk, rich in cheese-making properties, and in Canada she seems to have fully maintained her pre-eminence in this particular. Speaking from nothing but my own observations, I should say that the Canadian Ayrshire would average somewhat large than the same breed in the United States. This I think may probably be the result of the natural beef-breeding tendencies of Canadian farmers and the unconscious influence of Shorthorn neighbors. The report from the agricultural college concerning this race of cattle is as follows:

We have had a pretty thorough test of the Ayrshire cattle. In sure breeding we have no cause to complain nor can anything be said against their adaptability in raising a calf. Every cow we have has to be milked three and four weeks previous to calving—an imperative necessity to avoid milk fever; after calving, two of our best have regularly suckled two calves and, in addition, have had to be milked with the hand twice daily for two or three weeks, depending upon the time of year, whether on grass or in stall. We have not, however, been treated to that continuance of milk that I was intimate with in the Lothian of Scotland—the great flow lessening more rapidly and dribbling too long. I do not attribute this to actual poorer pasture or keep otherwise, but to the great difference in climatic condition and the want of that important variety of grasses secured only in permanent pasture. It is not true in our experience that the Ayrshire cow gives a lack of milk on comparatively bare pasture, in which regard she is on an average decidedly inferior to the Canadian, but it is true that her milk is of that blue type—not so rich in cream—as characterizes them in their own country. * * * Practically, then, as regards the pure Ayrshire, they require good treatment in order to maintain their famous milking properties, and I am of opinion that an infusion of new blood is as often needed as in any other breed—not so much a change of bull from other herds in this country as that of a directly imported one.

As to prices I am quite sure that Ayrshires of pure blood of average excellence can be bought for much less money in Canada than in the United States.

THE CANADIAN HEREFORDS.

This breed is comparatively a newcomer in Canada, although Mr. F. W. Stone began importing them into this province in 1860, much to the amusement of the Shorthorn breeders, who had a curiously satisfied faith

that their favorite was the *ne plus ultra* of a beef animal and that any attempt to equal, much more surpass, it was simply ridiculous. The Herefords came, however, and they came to stay, and in the last few years have so pressed the Shorthorns for their laurels that it has long since ceased to be a matter for mirth with the Shorthorn men. As nearly as I can get at it, the comparative merits of the breeds are about like this: The Shorthorn is the better for stall feeding, the Hereford for grazing. The Shorthorn breeders generally concede this. I doubt if the Hereford breeders will concede anything. The Herefords on the college farm are reported as follows:

This breed has exhibited a very clear and steady line of conduct all throughout. No trouble in breeding and no petting required. The Hereford is a good mother, second only to the Devon in our experience, and ahead of its dangerous compeers, the Shorthorn and Aberdeen Poll. We have been charged with partiality and lack of practical experience in cattle life by one of our American critics—especially in comparing Herefords and Shorthorns. This is not true, and I trust will never be so. As responsible to a liberal Government and guiding a grand country it is above all things our religious duty to report just how it is in every case—no coloring, no exaggeration, and no understatement of anything whatsoever. To say more is unnecessary; to say less would savor of want of interest. The Hereford, I repeat, has shown a uniformity in conduct quite exceptional along with the Devon; without grain winter and summer, bran excepted, and the usual treat after calving, the Hereford keeps fat on pasture and in stable, never falling off, even when suckling. Greedy enough, no doubt—down to the horse manure—not a specialty, as showing a want of something, but a consistent looking out for number one. We have no breed, as a whole, nor individuals among breeds, that can touch the Hereford in maintaining flesh on pasture. * * * The fattening steer from the Hereford bull and Canadian [native] cow is quite characteristic. The marking is strong and unquestionable. The build is a Hereford in almost every detail, the pig ham (as age advances), the round, compact barrel, longish rumps, deep twist, and the general low, chunky set of the whole animal.

The Herefords have been gaining very rapidly in form for the last few years, and are now in great demand as stock bulls on the ranches and in the great herds of the plains. One prominent Hereford breeder says in a private note to me:

Within less than one year there have been five new breeders of Herefords added to the list in my immediate vicinity. The demand both here and in the West is increasing very fast.

Another, a breeder of both Shorthorns and Herefords, writes:

My impression is (although a Shorthorn breeder) that the Hereford cattle are the best grazers of any breed, particularly for the Western States—*i. e.*, they will make more good beef on pasture quicker than any other breed; of good constitution; suited to the Southern as well as the Western States. They are yearly in greater demand. If we had fifty times as many, they would sell in the Western United States. In the last four years more Herefords have been imported into Canada from England than any other breed.

The Hereford is invariably red, with a white face. They numbered in the province in 1882 seventy bulls and two hundred cows.

THE CANADIAN DEVONS.

For a medium-sized beefing breed, with a fairly good dairy attachment, the Devons have their admirers. They are a very handsome race of cattle, deep red, with fine shapely horns, and of a very uniform appearance. For working oxen they are unequaled, being always well matched, strong, and active. They are hardy and hearty. The report of them from the Agricultural college is as follows:

The remarkable feature of the Devon with us has been a uniform conduct—no coming and going in anything, but an even run of breeding, health, and good doing under all conditions. Summer and winter the Devon is equally at home—plump on

asture and in good heart in the stall without grain. They have also been particularly ood mothers, nursing their calves in a manner superior to anything in our experience. 'he Devon calf is always a full calf on its milk alone—rolling in fat, and with all the nild of an old animal. The particular character of the breed and rich milk give hese results. After weaning and all up to heiferhood breeding, there is a distinct eartiness and vigor, on the small scale as regards size; there is no stunting according o their kind, but one has to know the kind in order to appreciate the difference be- ween them and the larger beefers. We have never got much milk from a Devon, but n quality it is second only to the Jersey. The bull attains a greater size and weight proportionally to the cow than the same thing in most other breeds. * * * The Devon cow, therefore, is a milker in quality and moderate quantity, while the bull gives a frame to the steer that compares well with others for beef carrying. But the steer will not mature so early as the Shorthorn, Aberdeen Poll, and Hereford, nor even attain the same weight on an average.

The Devons number in the province about forty cows and twenty bulls.

THE CANADIAN BLACK POLLS.

The Aberdeen or Poll Angus is the same animal. The Galloway is now regarded as a distinct breed, but I am told by a large importer and a gentleman who has dealt in these cattle for many years that forty years ago they were all considered as one race of cattle, but that the respective breeders, living at the extremes of Scotland, after awhile naturally separated the cattle in their classification, and the one race became two; each one with a herd-book of its own. They are all, however, hornless, all black, and all Scotch. The Aberdeens are larger and finer—more like the Shorthorns—indeed it is not improbable that the original race has somewhere a Shorthorn cross. They are immense mountains of flesh and not without an odd beauty. The Galloways are coarser haired, smaller, and said to be hardier. The gentleman to whom I just referred told me that he imported some Galloways as many as twenty-five years ago, but that there was no demand for them and they gradually disappeared. Recently, however, they have commenced to be called for, and there is now quite a demand for them. This month he sent forty-seven head of Galloways from this city to Illinois, at an average price of $300. He brought them from Scotland in September. Of the Aberdeen Polls, Professor Brown says:

We hold the honor of having introduced this breed to Canada. * * * Our experience thus far is somewhat irregular: Health and breeding have been very good; milking sure, in moderate quantity and rich, with plenty of flesh, both in stall and on pasture, yet we have to record an indefinite sort of instability difficult to explain—I speak now of the first imported animals and their progeny, not of 1881 purchases. The instability in question has reference to a coming and going of health, especially in summer, as indicated by change of coat and general "staring" of the whole animal, as if going through a course of medicine. Individual animals of any class often do so, as everybody knows, but not a whole herd of one kind. There has been no sickness actually. We have on hand four very fine steers—the first cross of an Aberdeen Poll with Shorthorn grade cows—with which we trust to convince the province ere long as to the eminent beefing properties of the Black Diamonds of the north of Scotland.

ONTARIO JERSEYS.

There are two celebrated herds of Jerseys in this province, and several smaller ones. Mr. Fuller's herd has been made famous by the record of his Mary Anne of St. Lambert, that made 27 pounds 9½ ounces of butter in seven days, and as a result the Stoke Pogis blood is in great favor. At one time the same danger threatened Jersey breeding that has been referred to in speaking of the Shorthorns, viz: Family fashion

as opposed to the general improvement of the whole race. Fortunately, however, the claim that the Jersey was the best butter cow on earth was so soon challenged that it became the common interest of all Jersey breeders to improve the race as a whole, and no sooner has one "family" gone to the front than another has outstripped it, and the different strains of blood have become so mingled by anxiety of breeders to cross for merit—the only true theory of breeding—that it is almost impossible to tell which is the most potent blood element in any particular animal, and quite as impossible to say which is the best of a score of Jersey "families" as it is to find a straight pedigree, with no outcrosses in any. At the present time an Alphea, a Coomassie, a Rex, a Signal, a Jersey Belle of Scituate, a Eurotas, or a Stoke Pogis, and a hundred others, means very little and is worth very little in the name, *unless* the immediate ancestors have a butter record at the scales. The general demand for a "test" has benefited immeasurably the whole Jersey race and destroyed at once and forever the silly "family" folly and the still sillier "color" craze. It is possible that the whole Jersey race is of such uniform excellence that all that is needed at any time or in any place is a little extra feed and a little extra care to *create* a "family." At all events, henceforth, there is no royalty in Jerseys, and "the best cow wins." Prices are higher in Canada, on the average, than in the United States, and if we needed a market we could find a profitable one here.

CANADIAN HOLSTEINS.

There are some Holsteins in Canada, but not many. Their admirers claim for them size and an immense yield of rich milk, and consider them the best "general purpose cow" in the world.

GENERAL REMARKS.

Considering that facts *bona fide* from breeders would be of much more value than any amount of theory or guess, I sent out printed interrogatories to many of the leading breeders in Ontario, and although I did not receive as many replies as I could wish, yet such as I have received I have placed as far as possible in tabular form at the close of this report. It is almost the universal custom among the Shorthorn breeders to allow the cows to suckle their calves for from four to six months, and I judge the same practice prevails generally among the other beefing breeds. Of ordinary cattle for slaughter this province has a large surplus, which seeks a market both in the United States and England. I have given some figures elsewhere upon this point. Of the pure bloods there is really no surplus, although some bulls of the beefing breeds, and cows to a less extent, are sold in the United States, and on the other hand others are brought in from there. The trade in these animals is unique and has not yet acquired a steady flow in either direction; if the United States had a surplus of almost any breed except Shorthorns, Ayrshires, and Devons, I think a market could be found here. Canada seems to be sufficiently supplied with those named.

In the following tables I have endeavored to present in as compact a form as possible the facts offered by the various breeders who have furnished me information. These reports from various herds represent *averages* in these herds. The question concerning soil, grasses, &c., were generally answered. The altitude and mean temperature of the different localities were not generally known. The Toronto Observatory

gives the elevation of Toronto above Lake Ontario at 108 feet, and the approximate elevation above the sea, 350 feet; the mean temperature for 1882 was 45.42°; highest, 89.9°; lowest, 17.4°.

The herds represented in these tables are, many of them, large prize-winners. In one or two instances there seems to be an evident *anomaly*, but I have given the figures as they were given to me. The same number refers in each case to the same herd.

WALTER E. HOWARD,
Consul.

UNITED STATES CONSULATE,
Toronto, December 29, 1883.

Special statistics concerning Ontario cattle.

Breed and herd No.	Males.	Females.	Months in milk.	Yearly yield of milk.	Milk for 1 pound butter.	Milk for 1 pound cheese.	Age at maturity.	Live weight at maturity.			Weight of meat at maturity.			Price.			
								Cow.	Bull.	Ox.	Cow.	Bull.	Ox.	Cow.	Bull.	Cow calf.	Bull calf.
Shorthorn:				*Lbs.*				*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*				
1	15	45					4	1,800	2,400	2,000				$150	$100	$120	$150
2	6	44	7				3	1,800	2,500	2,400	1,000	1,400	1,200	300	400	200	300
3	5	34					3	1,700	2,300	2,200	1,020	1,450	1,475	200	150	150	100
4	2	15					3	1,600	2,000					250	250	250	250
5	5	22					4	1,700	2,400	2,100	1,225	1,850	1,000	250	200	150	150
6	4	22	9	4,050	25		3	1,600	2,200	1,800	1,200	1,600	1,400	150	150	100	100
Ayrshire:																	
1	10	30	9	7,000	25	10	3	1,050	1,600		800			125	125	50	50
2	14	26	10				5							150		60	
3	3	30												100	100		50
4	3	62	10	6,000			3							150	300	100	125
5	4	22	10	5,700	22	9	5	950	1,050		500	600		75	50	25	10
6	2	25	10	5,000	28	10	6	900	1,700		600	1,200		125	100	35	30
Hereford:																	
1	35	100	7					1,500	2,000	1,800	975	1,360	1,170				
2	6	18	8				3							450		300	250
Devon:																	
1	5	4	2	6,000	20	10	6	1,400	1,900		950	1,250		100	125	75	75
Galloway:																	
1	10	45	9				3	1,300	2,000					300	400	200	200

GENERAL AVERAGE.

Breed.	Origin.	No. of herds.	Aggregate number of animals.	Average months in milk.	Average annual yield of milk.	Milk to 1 pound butter.	Milk to 1 pound of cheese.	Age at maturity.
					Lbs.			
Shorthorn	England	6	220	8	4,050	25		3½
Ayrshire	Scotland	6	238	9½	5,925	24½	9½	3
Hereford	England	2	159	7.5				3
Devon	do	1	11	8		20	10	3
Galloway	Scotland	1	45	9				3

GRADE AND NATIVE CATTLE.

The number of grade and native cattle in the province of Ontario is given in the following table for the years 1882 and 1883:

Description.	1883.	1882.
Working oxen	17,086	14,586
Milch cows	691,808	665,282
Store cattle (over two years)	322,154	272,592
Other cattle	790,949	610,527
Total	1,821,997	1,562,983

In 1882 the number of thoroughbred cattle of all kinds was estimated at 13,000.

CATTLE IN ONTARIO.

REPORT BY CONSUL HAZELTON, OF HAMILTON.

I have the honor to transmit this report with inclosures in compliance with "Cattle circular of July 18, 1883," issued by the Department of State.

The total number of thoroughbred cattle in Ontario is about 23,704, of which 15,385 are Durham (Shorthorn), 4,496 Ayrshire, 1,438 Devon, 1,189 Galloway, 841 Hereford, 270 Aberdeen Poll, and 85 Jersey.

These are distributed through the several counties of the province, as shown in accompanying table * inclosed. In addition to these about fifty Holsteins have been imported this year from Holland for breeding purposes. There are several breeders of blooded cattle in Eastern Ontario to whom I am indebted for information received concerning the breeds kept by each. Most of their herds have been bred pure since imported, which is about twenty years. All say that these breeds are superior in Ontario to the same breeds in their native countries, maintaining that the cold dry climate of Canada is eminently fitted to impart constitution and quality to pure-blooded cattle.

In Ontario the Durham takes the lead, comprising 65 per cent. of the entire number. It is a good milker, produces superior beef, is not especially expensive to raise, and when crossed on a native cow the grade is very satisfactory. It is the oldest of the imported breeds, and its qualities are better understood by farmers generally than those of any other.

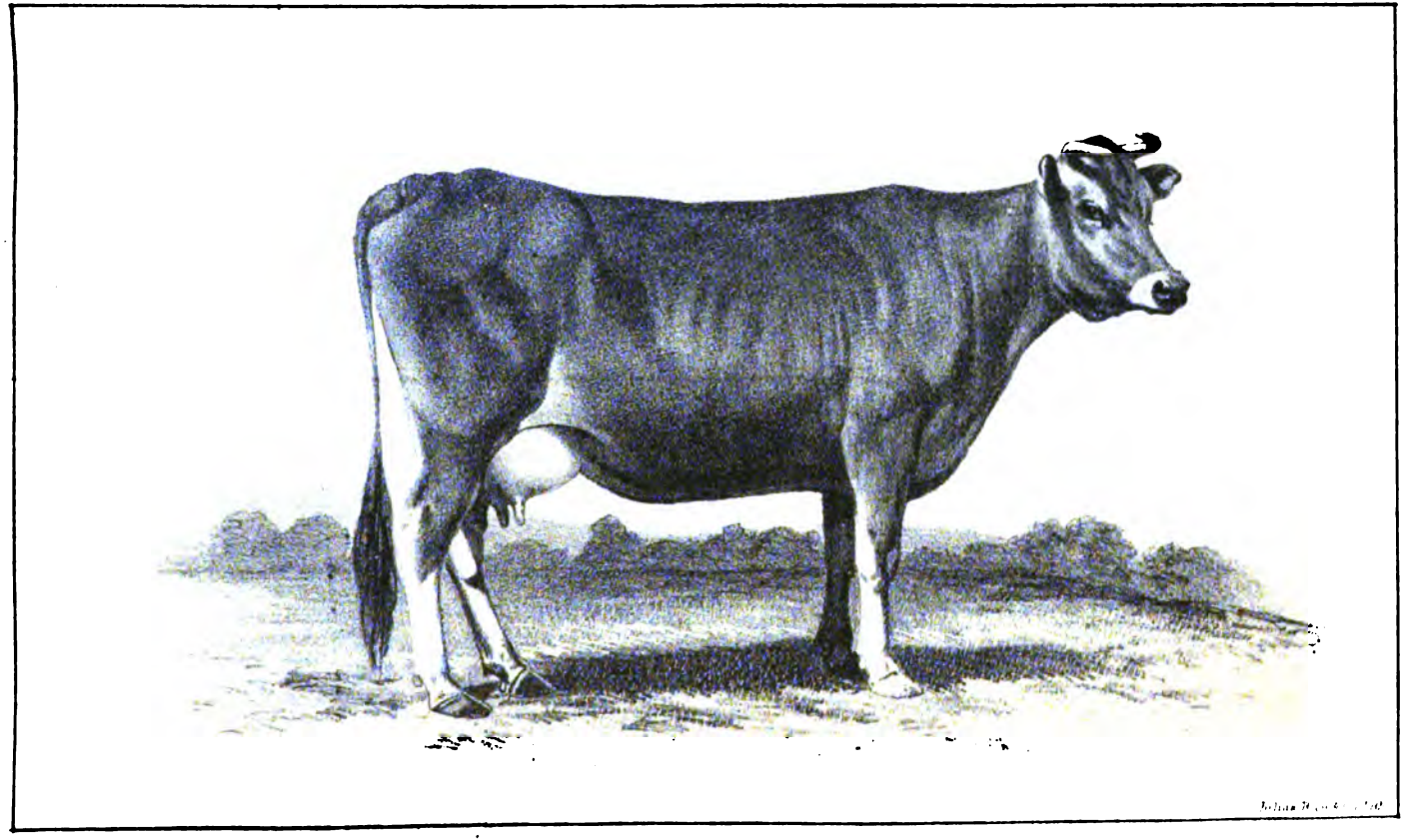
The Ayrshire stands next in favor, being celebrated for its cheese-producing qualities. It comprises about 19 per cent. of the entire number, but is not increasing.

The Hereford is hardy, and is chiefly celebrated for its beef-producing qualities. Mr. Frederick W. Stone, of Guelph, a man of large experience in breeding stock, writes me regarding the Hereford as follows:

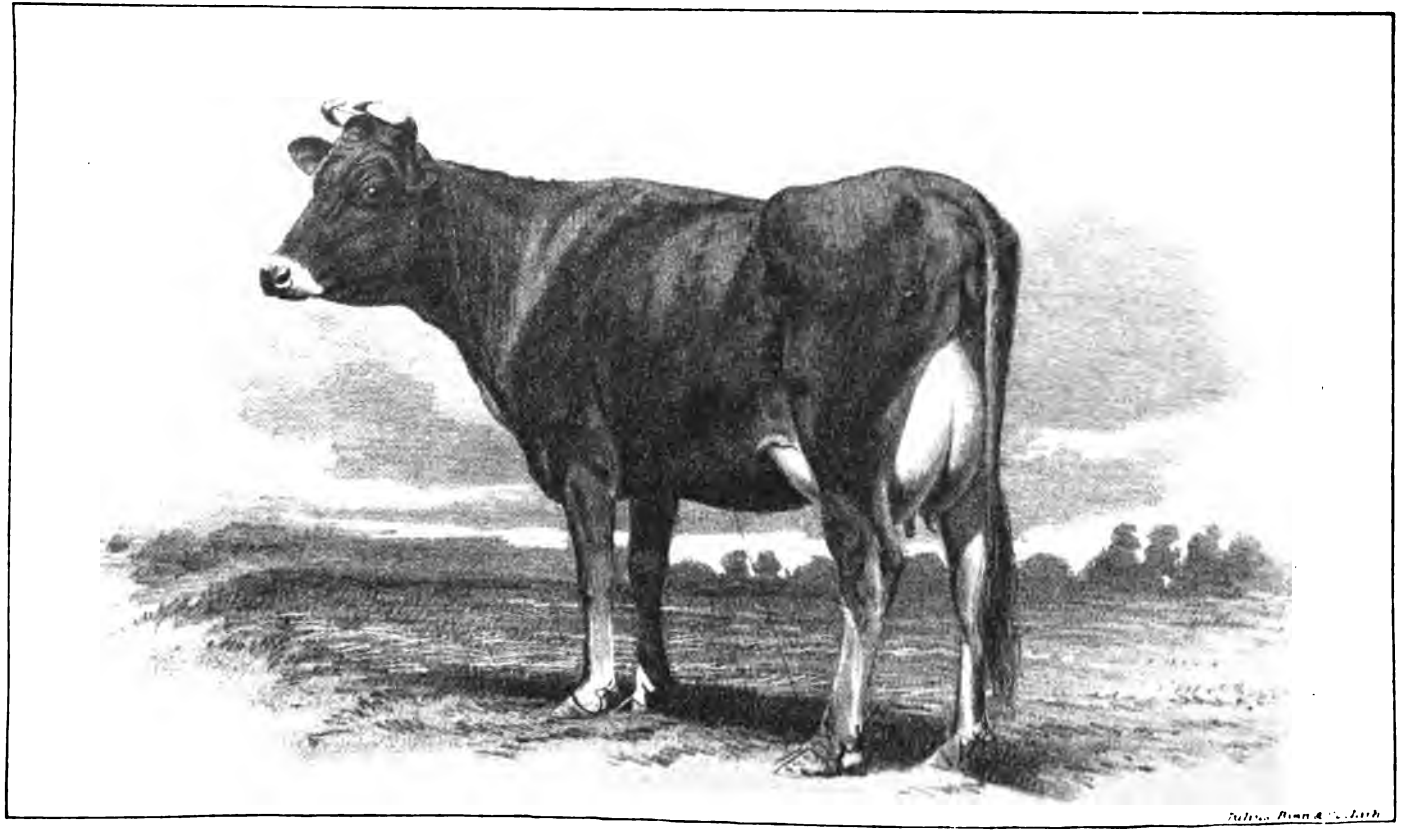
The Herefords thrive well on good pasture, stand heat better than many breeds, also cold, are generally of good constitution. I think they are the best grazers of any pure breed of cattle, and superior to any to cross on the native cattle in the Western and Northern States. The percentage of Herefords is 3¼.

* A printed table (Canadian official), containing the same statistics covered by Consul Hazelton's table here referred to, with the exception of eighty-five Jerseys in Wentworth County, will be found embodied in the report from Consul Pace, of Port Sarnia. For this reason Consul Hazelton's table is omitted.

PLATE 258



"OAKLANDS CORA"



MARY ANNE OF ST LAMBERT

The Devon possesses many of the qualities of the Durham and is preferred by some, although not generally a favorite. Of these the percentage is 6.

Galloways comprise 5 per cent. These are without horns, are average milkers, and produce an excellent quality of beef.

The Aberdeen Poll is also chiefly celebrated for its beef-producing qualities.

The price of bulls of the several breeds above named ranges from $50 to $200 each, according to age and quality, those from one and one-half to two years old being preferred.

The number of each of these breeds, excepting the Durham, in Ontario, is so small that they may be fairly said to be on trial. A disposition to investigate the qualities of the same exists largely among the farmers, however, and a small number of one of the choice breeds may be found frequently on the stock farms, where they are kept for breeding purposes.

Very few are sold outside the provincess so far as I can learn, but the surplus finds its principal market at home.

EXPORT OF FANCY JERSEYS TO THE UNITED STATES.

The number of Jerseys in Ontario is so small that it was omitted entirely from the cattle reports of 1882. There is a herd of this breed, numbering eighty-five, near Hamilton, owned by Valancey E. Fuller, whose letter I inclose. In this herd is the celebrated cow "Mary Anne of St. Lambert," which has made an average of 3½ pounds of butter per day for one hundred and fifty consecutive days. The reputation of this cow has extended to the United States, resulting in a demand for Jerseys at high prices. In answer to which Mr. Fuller has sold and delivered to various parties in the United States during the months of October and November, twenty-four of these cattle of various ages, at prices ranging from $400 to $6,000 each, amounting in the aggregate to the sum of $40,000, no other breeding cattle having been shipped from here during the past year. These have been shipped from here by rail at an expense ranging from $25 to $50 each, according to distance and circumstances. Heifers and young bulls are delivered with less cost and trouble than milch cows and older bulls. With the latter a man is usually sent to attend the same as required, thereby increasing the cost of delivery in the amount paid for railroad fare, wages, and personal expenses of the attendant. Several of the yearlings have been delivered by express. These were tied in small movable wooden stalls made for that purpose, and in that manner put on board the express car and carried to their destination.

I inclose cuts of the celebrated Jersey cow "Mary Anne of St. Lambert," and "Oakland's Cora," of the same herd, furnished me to-day by the owner.

MISCELLANEOUS INFORMATION.

The increase of stock in this province is considerably in excess of the home demand. The surplus in this district finds its principal market in the United States.

Of the whole number of cattle in Ontario the percentage bred for the dairy is 42, for the butcher 17.

The soils of Ontario are variable, but all are well adapted to grazing purposes.

In the western half of the province there is a great depth of alluvium, chiefly Erie and Saugeen clays and Artemesia gravel, which form the

bases of the soils. In the eastern part, say east and north of a line drawn from Kingston to Collingwood, the average depth of alluvium does not exceed a few feet, and is generally of Laurentian or Huronian origin. The middle section partakes of the nature of both the others.

The pastures are generally rich, and the country abounds in lakes and streams.

J. F. HAZELTON,
Consul.

UNITED STATES CONSULATE,
Hamilton, January 10, 1884.

Special statistics concerning cattle in Eastern Ontario.

Name of breed.	Annual average yield of milk.	Milk to pound of butter.	Milk to pound of cheese.	Live weight, average.			Age at maturity.	Weight of meat at maturity.
				Cow.	Bull.	Ox.		
	Pounds.	*Pounds.*	*Pounds.*	*Lbs.*	*Lbs.*	*Lbs.*	*Years.*	*Pounds.*
Ayrshire	6,000	23	10	800	1,200	1,400	3	750
Aberdeen Poll	6,000	24	10	900	1,500	1,600	3	900
Devon	5,500	22	10	900	1,500	1,600	3	900
Durham	5,500	22	10	1,000	1,600	1,800	3	1,000
Galloway	6,000	24	10½	950	1,500	1,600	3	900
Hereford	6,000	24	11	1,000	1,600	1,800	3	950
Holstein	6,500	26	12	950	1,500	1,600	3	850
Jersey	6,500	20	10	800	1,200	1,400	3	700

Name of breed.	Color, &c.	How long bred pure.	Origin of breed.
		Years.	
Ayrshire	Spotted, red and white; fine sharp head; heavy behind; long horns.	20	Scotland.
Aberdeen Poll	Black; no horns; heavy	10	Do.
Devon	Brown; long bodies; well shaped	20	England.
Durham	Dark brown; short horns; heavy quarters	25	Do.
Galloway	Black; no horns; ungainly	10	Do.
Hereford	Red with white face; short legs; long bodies	20	Do.
Holstein	Spotted, black and white; horned; large		Holland.
Jersey	Gray; small limbed; smooth	15	Jersey.

Topography: Altitude, 250 feet above the level of the sea. Mean temperature, 45.42°; summer, 57.66°; winter, 33.17°. Soil: A few feet of alluvial in Eastern Ontario, great depth in Western Ontario, and middle section an average; loam, clay, sand, &c., to some extent; all three in Eastern Ontario, according to location. Substratum: Limestone, large quantity; sandstone to some extent; granite, very little; clay and gravel, large quantities.

Cultivated grasses: Timothy and clover are among the principal crops; rye-grass not abundant.

Housing, feeding, &c.: The cattle are housed in good barns with sheds attached, most of them tied up in winter at night; others in stalls and boxes, depending on kind and value of animal. Good mixed hay, a few roots, and a small quantity of chopped oats, corn, peas, or barley in winter constitute the feed. For breeding the male and female of good constitution and qualities are used. The product is sold generally to farmers and breeders to improve their stock.

JERSEYS IMPROVED BY IMPORT.

Mr. Valancey E. Fuller to Consul Hazelton.

HAMILTON, ONT., *December* 17, 1883.

DEAR SIR: As you are aware the character of the soil in and around Hamilton is from a light sandy, gravelly soil to a stiff clay, and this part of Ontario is underlaid by limestone.

Jerseys have been bred within 60 miles of Hamilton for the past eight to ten years. I have now on my farm 5 miles from Hamilton the largest herd in Canada, numbering 85 head. There are in Ontario about 600 thoroughbred Jerseys.

In my herd is the cow Mary Anne of St. Lambert (four years old), who has made the largest weekly yield of butter, 27 pounds 9½ ounces in seven days, and the largest yield ever made for five consecutive months of one hundred and fifty-five days, 511 pounds 9½ ounces, and an average of 3½ pounds of butter per day for one hundred and fifty consecutive days. She, like the majority of my herd, was raised in Canada, near Montreal, as were a majority of her ancestors, proving clearly the Jerseys are capable of standing our extremely cold dry climate, inasmuch as the thermometer goes as low as 20 degrees below zero at Montreal, and the winter there is a very severe cold one. It is, however, very dry.

My experience of the Jerseys bred for any length of time in Ontario or the province of Quebec is that they increase in size very materially; that their constitution is very greatly strengthened, and that consequently they are larger milkers than with less constitution and size. This size is attained without losing their characteristic faculty of being able to convert their food into milk very rich with butter fat. I attribute this increase in constituton and size very greatly—

(1) To our climate, believing the same experience holds good with cattle as with human beings, the nearer we approach the north pole the more robust and vigorous do the race of men (and I think cattle also) become. The dryness of our winter prevents the extreme cold being so much felt, and imparts vigor to the system. I consider the cold bleak winds of the Atlantic coast far more trying to the cattle than our climate. Certain it is that (save in very extreme range of temperature) the Jerseys yield quite as large if not larger quantities of milk in a cold dry clear day than in a milder damp one in winter. We have no artificial means of heating our stables, yet the cattle never suffer from the cold. They are let out daily; in fact our custom is to rear many of our finest yearlings in the barn-yard and we consider the results most beneficial. Certain it is, that when our Jerseys, imported from the island of Jersey, have spent two to three winters with us they not only improve very materially in constitution, but are heavier milkers. Their progeny begot and dropped in this country have better constitutions.

(2) The limestone which underlies all our soil in this part of Onatrio also contributes largely to the development of bone and constitution.

(3) The rich clover which abounds on good farms has in no slight degree assisted in making the Canadian Jerseys famous.

You have passed for me in one month stock sold to the United States amounting to no less a sum than $40,000 for twenty-four head, many of them under two years old. These prices demonstrate the value they realize, and I am convinced that in our climate and with our grasses and pastures the Jerseys will thrive and improve.

The average production of milk in my herd is about 4,000 pounds per annum for heifers two to three years old, and from 5,000 to 7,000 pounds of milk for mature cows, though I have cows who give from 7,000 to 8,000 pounds of milk per annum.

Yours, truly,

VALANCEY E. FULLER.

J. F. HAZELTON, Esq.,
American Consul.

CATTLE AND CATTLE PRODUCTS IN SOUTHWESTERN ONTARIO.

REPORT BY COMMERCIAL AGENT BUFFINGTON, OF CHATHAM.

I have the honor herewith to submit the report requested by the cattle circular of July 18. I regret that, owing to an insufficient number of accurately recorded experiments by the breeders of the district, many blanks in the tabular form remain unfilled, while many of the statements filled in cannot lay claim to more than approximate accuracy.

CATTLE-BREEDING IN THE CHATHAM DISTRICT.

It is only within the last few years that, alarmed by occasional failures of the grain crops, the agriculturists in this district began to de-

vote special attention to the improvement of their herds upon scientific principles, and, as yet, the number able to state, with any degree of definiteness, the particular merits or demerits of any certain breed, reduced to figures, is indeed limited.

It is evident that this level, moist, generous, pasture-producing country is admirably adapted to stock-raising, as with the common, or "scrub" animals, interspersed with a small number of good grades and occasionally a few thoroughbreds, it bears an enviable reputation as a cheese and butter producing district, and one that is fully justified by the large and continually increasing output of the factories. Until recently the farmers had not awakened to the advantages to be derived from securing the best and most profitable fodder utilizers to consume the surplus feed of the farm.

The Ontario government has extended every encouragement to stock-raisers, and maintains, at a considerable annual outlay, an agricultural college and model farm at Guelph, where stock-breeding on scientific principles receives merited attention. The advantages afforded by this institution would, from the number of its students, seem to be fully appreciated by the agricultural community. Its teachings and reports, which are freely circulated, furnish information as to the relative qualities of the various breeds of cattle, &c., not easily attainable by the average farmer, few of whom have either facilities or patience to institute the comparisons there conducted, and which are so useful to the herd-owner.

The number of thoroughbreds in this district is not inconsiderable; and most of them are selected, imported males. The favorite shipping animal is the Durham grade—either a first or second cross of a pure breed male on a common or grade cow—which is in general favor. The peculiar merits claimed for it are rapid growth, early maturity, and large size. Some phenomenal weights are on record, and at a period when the "scrub" animal is too young for profitable fattening.

The Ayrshire is in high esteem by dairymen, and produces excellent general-purpose grades from thoroughbred Durham males.

The native, or Canadian breed—the old bush-rambling cow, with perhaps a strain of finer blood—is a good milker and to a Shorthorn bull produces excellent general-purpose stock, remarkable for hardihood and milking qualities, under conditions of temperature and diet ruinous to a thoroughbred.

What breeders in this locality are anxious to secure is—(1) a weight-carrying frame; (2) an early maturer, say from two to three years; (3) a good forager; (4) fine flesh and minimum offal; (5) sure breeders and good nurses.

Extensive observation by the largest breeders here confirm them in favor of—(1) Shorthorn grades for weight, early maturing and stall feeding; (2) Hereford grades for hardiness and grazing disposition; (3) Aberdeen Poll grades for an even average; (4) Galloway grades for hardiness and fine flesh; (5) Devon grades for good nursing and sure breeding.

RELATIVE YIELDS OF THE DIFFERENT BREEDS.

To aid in an understanding of the relative merits of the respective breeds I embody herewith a table showing the results of nearly five thousand tests made at the Agricultural College and Model Farm:

Breed.	Average weight of cow.	Duration of milking season.	Milk, per season.	Specific gravity of milk.	Per cent. of cream.	Cream by weight.	Butter from—		Cheese from milk.	Value per season of—			
							Milk.	Cream.		Milk.	Cream.	Butter.	Cheese.
	Lbs.	*Days.*	*Lbs.*			*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*				
Shorthorn	1,570	170	2,550	97	10⅜	8⅜	4½	.....	12	$19	$11	$22	$30
Shorthorn grade	1,450	220	3,960	106	8¼	5	2½	46	11	30	10	18	42
Aberdeen grade	1,300	170	2,380	111	7	6	3½	40	11⅛	18	7½	16	27
Aberdeen Poll grade	1,150	190	3,040	109	4½	6½	.....	.....	.....	23	9⅜	.....	.....
Hereford	1,340	180	2,340	97	5⅛	4½	2	50½	11⅛	17	5½	11	26
Hereford grade	1,100	200	3,570	100	13⅜	6½	2½	40	7	27	11⅛	18	26
Devon	1,050	200	2,800	113	7⅜	8	3½	.....	16½	21	11⅛	19	45
Galloway	1,250	190	2,470	105	2	6½	.....	.....	9⅜	18½	8	11	23
Ayrshire	1,000	210	5,250	101	6½	8	3½	.....	11⅜	30	21	35	58
Ayrshire grade	1,030	220	4,400	102	4⅜	5	.....	.....	.....	33	11	.....	.....
Jersey	740	200	2,500	103	34	37	.....	.....	.....	19	57	.....	.....
Canadian	950	240	4,800	95	6½	8	.....	.....	11⅛	36	19½	29	54

NUMBER AND KINDS OF CATTLE IN THE CHATHAM DISTRICT.

The number of cattle in three counties, as per report of the Provincial Bureau of Agriculture, with a classified list of thoroughbreds, is given below.

County.	Thoroughbred.	Grade and native.				Milch cows, all breeds.	All classes.
		Oxen.	Milch cows.	Store cattle over 2 years old.	Other.		
Essex	434	251	9,080	4,633	10,292	9,742	25,292
Kent	550	161	16,960	8,622	17,056	17,035	43,049
Lambton	660	35	15,689	11,145	20,262	15,787	47,701
Total	1,644	447	42,329	24,400	48,210	42,564	117,032

	Durham.	Devon.	Hereford.	Aberdeen Poll.	Galloway.	Ayrshire.
Essex	246	34	33	25	17	79
Kent	391	33	41	1	37	48
Lambton	488	71	8	5	34	54

RELATIVE VALUES OF CATTLE FEED.

The following results of a critical test as to the relative value of various diets in their effects on the different breeds will not, I conceive, be without interest in this connection, as illustrating their particular idiosyncrasy as to fodder:

[From Model Farm Report.]

Corn fodder newly cut and drawn from the field when green, cut into inch lengths, packed into a common rough stone root cellar half under ground, and weighted with 600 pounds per superficial square yard, can be preserved, except adjoining such a wall, for an indefinite time in a condition fit for animal food, at a cost not exceeding $1 per ton, exclusive of cultivation.

In competition with Swede turnips, ensilaged corn fodder gave 15 per cent. less milk, 30 per cent. less butter, and a poorer marketable butter in color.

Damaged wheat can be very economically used in the fattening of cattle—9 pounds per head per day give a daily increase of 2 pounds per head per day, at a cost of 4½ cents per pound to the live weight.

Rice meal in the fattening of cattle gave a daily increase of 1.81 pounds per head per day, by the use of 6 pounds per head per day, at a cost of about 7 cents per pound.

Barley meal in cattle fattening requires a large amount of other foods in association, and 11½ pounds per head per day gave a daily increase of 2.14 pounds per head per day, at a cost of 7 cents per pound live weight.

Corn meal took the highest place in a daily rate of increase in the fattening of cattle; 9½ pounds per head daily gave 2.31 pounds per head per day, at a cost of 5½ cents per pound of the added animal weight.

Pea meal gave the second best daily rate of increase at the least cost of all the regular cattle-feeding grains. Eight and one-half pounds per head daily gave a rate of 2.28 pounds, at a cost of 5 cents per pound of the weight added to the animal.

A pure-bred Shorthorn steer can be brought to a weight of 1,700 pounds when one month under two years old, or a daily rate of increase equal to 2½ pounds per day.

Hereford grade steer calves can be made to average 611 pounds in 238 days, or a rate of 2½ pounds per day.

Aberdeen Poll grade steer calves can be made to average 720 pounds in 273 days, or a rate of 2⅔ pounds per day.

During winter, a 1,000-pound steer will consume daily 10 pounds hay, 39 pounds turnips, 4 pounds bran, and 9 pounds of a mixture of grain, upon which it will add 2.11 pounds to its live weight.

One pound of added weight to a 1,000-pound steer can be obtained from the use of various materials that contain 11 pounds of dry substances chemically.

By a large variety of experiments with several classes of cattle and many kinds of food, we find the actual cost of adding 1 pound to the live weight of a 1,000-pound animal is 6 cents to the feeder who grows his own materials, and nearly 12 cents when the food is bought in the regular market—manure and management not considered.

Sugar beet, weight for weight with mangels and turnips, and in association with equal kinds and quantities of other foods, gave the highest returns in feeding cattle, or 2.70 pounds per head per day.

Mangels gave 2.38 pounds per head per day under similar conditions to the sugar beet.

Turnips (Swede) added 2.30 pounds per day to the average steer that weighed 1,061 ounds under conditions similar to mangels and sugar beet.

There is either a simple natural reason, or a hidden chemical one, in the fact that by the use of less grain and more roots, cattle gave a greater daily return in live weight.

COST OF CHATHAM CATTLE.

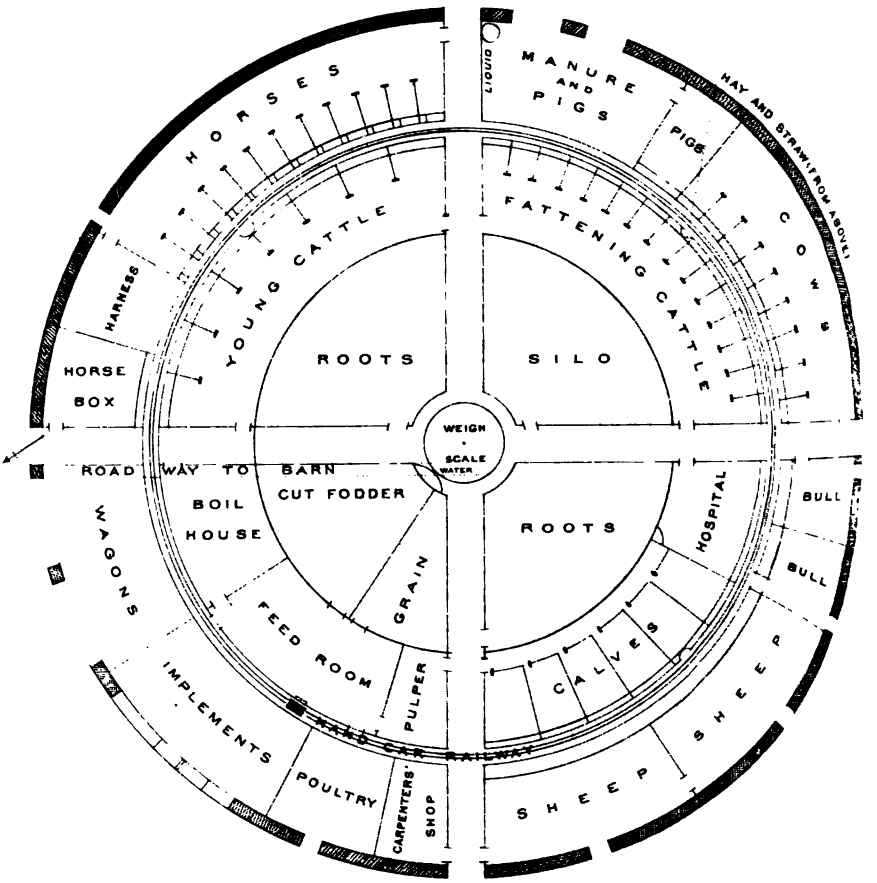
Selling prices vary widely, not only with the breed but also with the particular merits of the animals. Good pure bred bulls, fit for service, can be had at from $100 to $300, and younger animals at considerably lower prices, although it is not unusual to hear of fancy prices being paid for extra good stock.

BEEF EXPORT OF THE CHATHAM DISTRICT.

The beef trade is principally with Great Britain, and is found to grow more profitable as better stock is introduced. Beeves of 1,500 pounds and upwards pay well, and, as is obvious, the per capita cost of marketing a steer of 1,000 pounds or one of 1,800 to 2,000 pounds being the same, size is, for that consideration, as well as a demand in the foreign market for heavy stock, a desirable attainment. The average ruling figures for some time past have been from 5½ to 5¾ live weight, while for export, prices have ruled higher, better stock being required.

Before the abrogation of the reciprocity treaty considerable traffic in cattle was carried on between the United States and this province, via Port Huron, Detroit, and Buffalo, notably the latter. This has since greatly diminished, while the export to the British markets has largely increased.

Notwithstanding the small proportion of thoroughbreds in the district, there is always a large surplus of excellent stock suitable for beef, a fair proportion of which passes muster for the export trade. There is no lack of buyers at the barnyards and at the agricultural fairs.

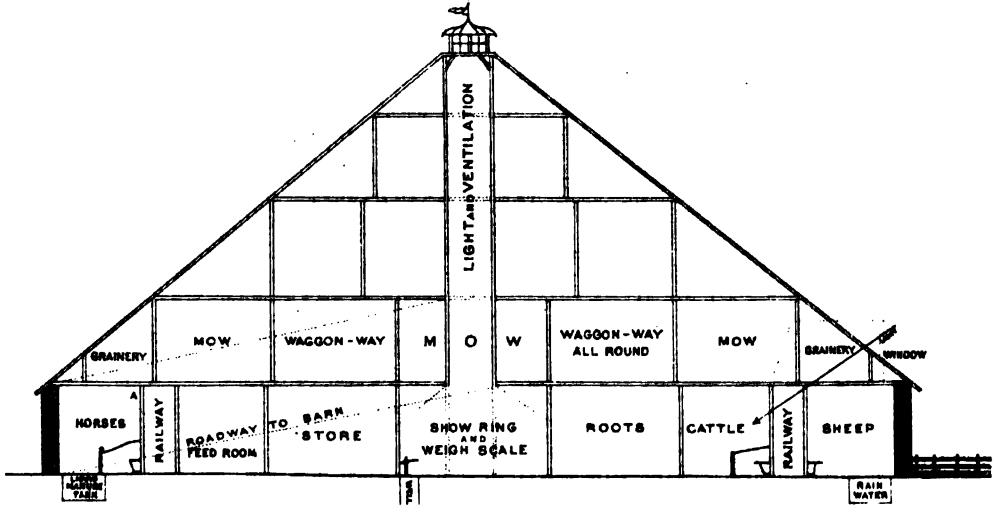


FARM BUILDINGS OF THE FUTURE

PLAN ILLUSTRATING PRINCIPLES IN ARRANGEMENT
AS TAUGHT AT THE GUELPH, ONTARIO, EXPERIMENTAL FARM

Julius Bien & Co. Lith

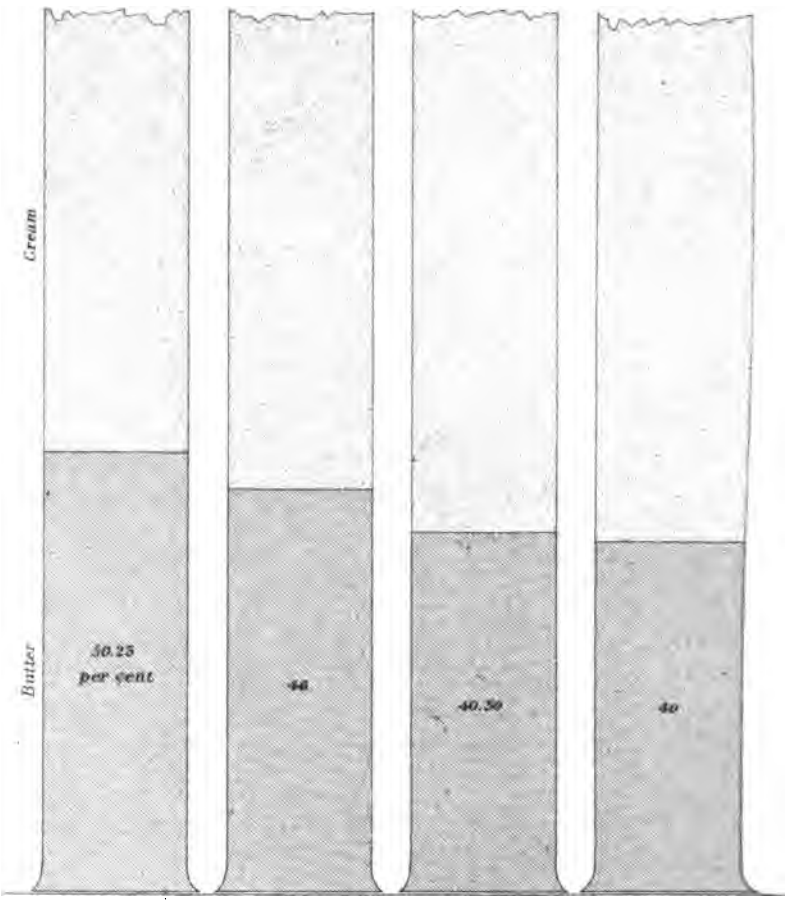
PLATE 266



PLAN OF THE MODEL STOCK BUILDING.

EXPERIMENTAL FARM, GUELPH, ONTARIO.

FIG. 7.

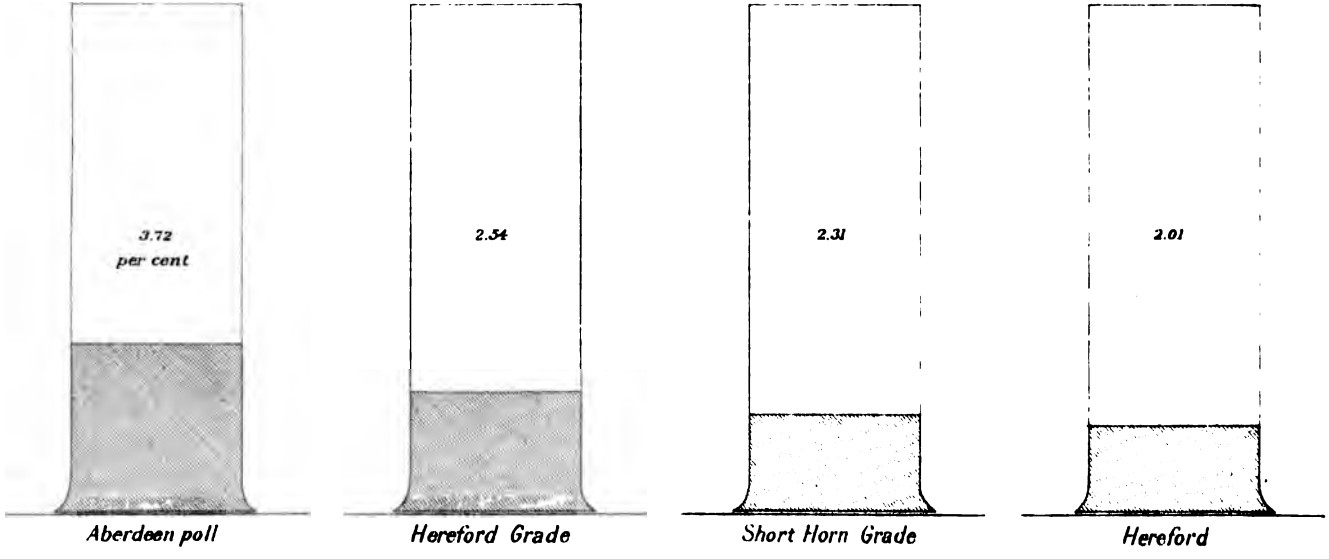


Julius Bien & Co. Lith.

MILK, CREAM & BUTTER TESTS.

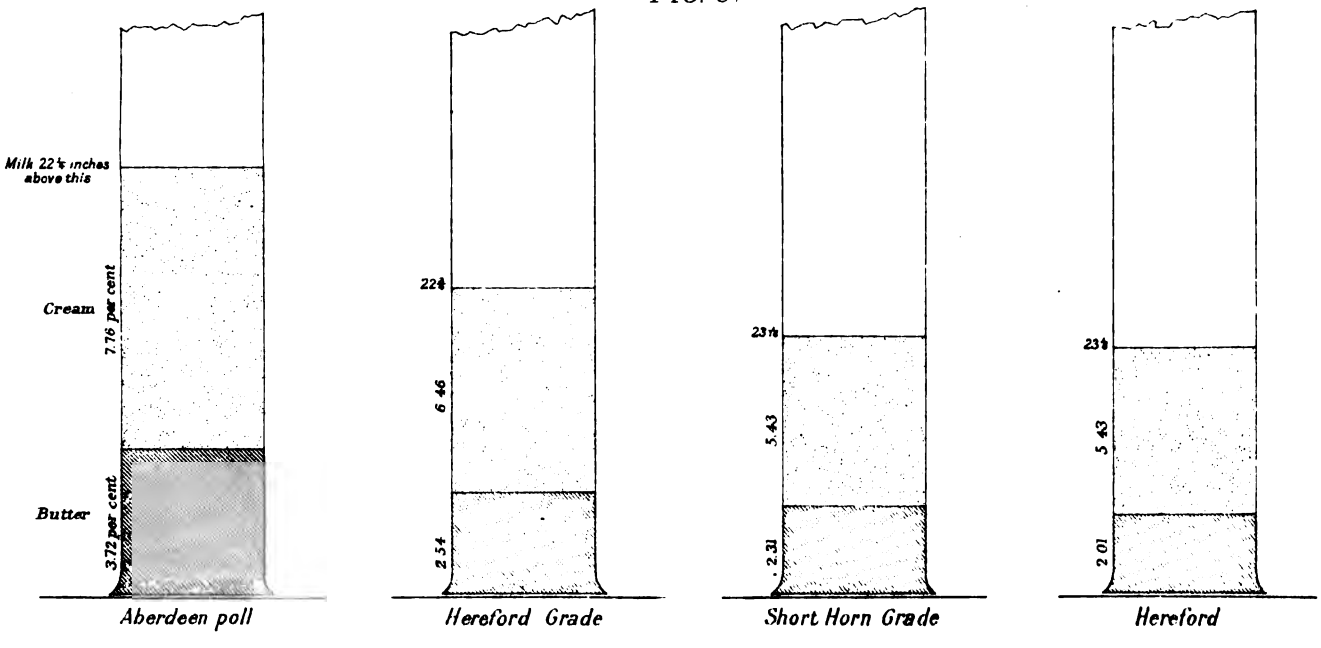
BUTTER FROM CREAM.

FIG 5



MILK, CREAM & BUTTER TESTS.

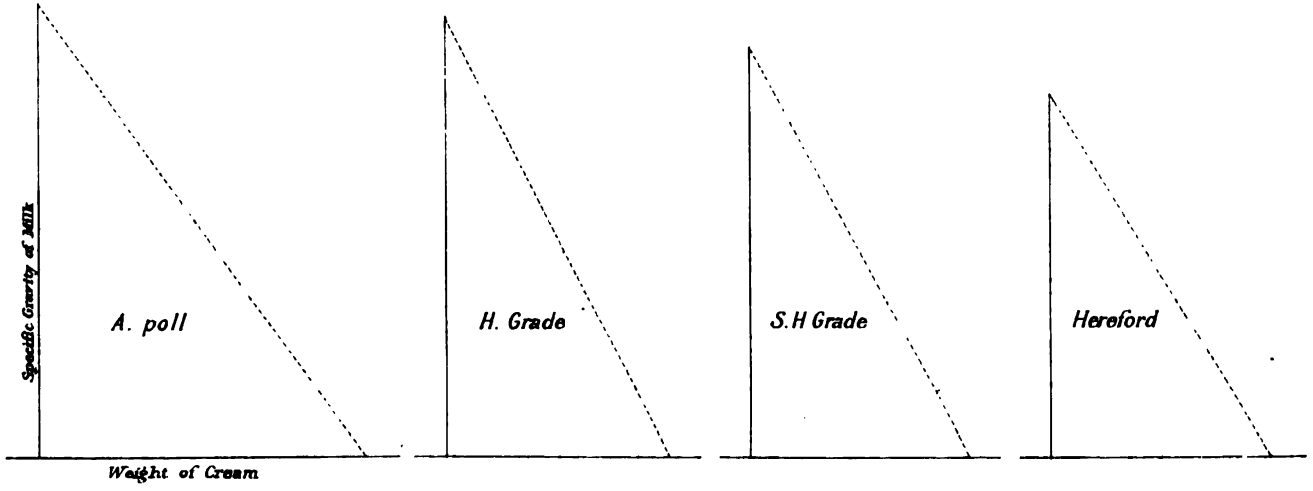
FIG. 6.



MILK, CREAM & BUTTER TESTS.

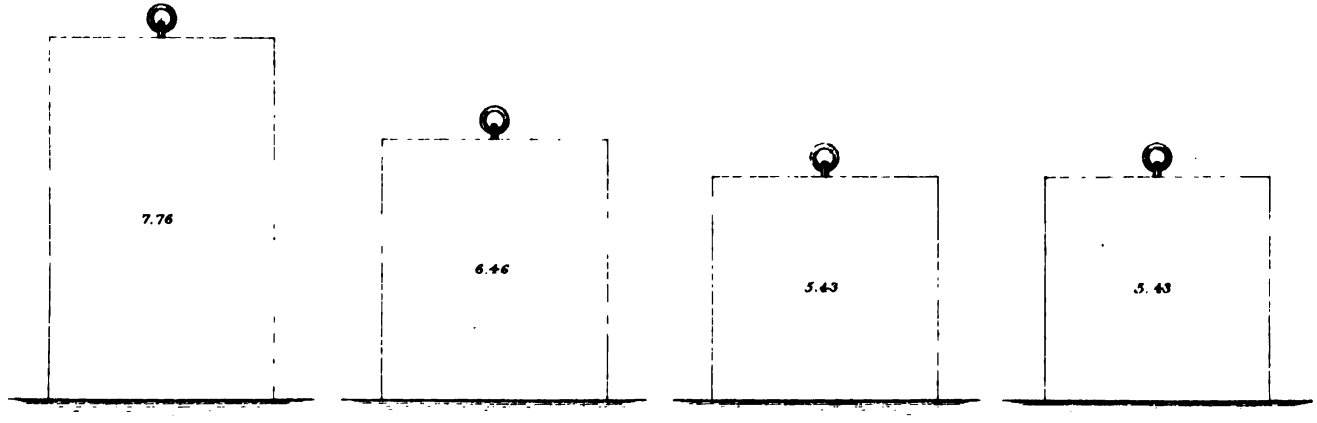
AGREEMENT OF CREAM, BY WEIGHT WITH BUTTER, BY WEIGHT FROM MILK

FIG. 4.



MILK, CREAM & BUTTER TESTS

FIG 3.



MILK, CREAM & BUTTER TESTS

FIG. 2.

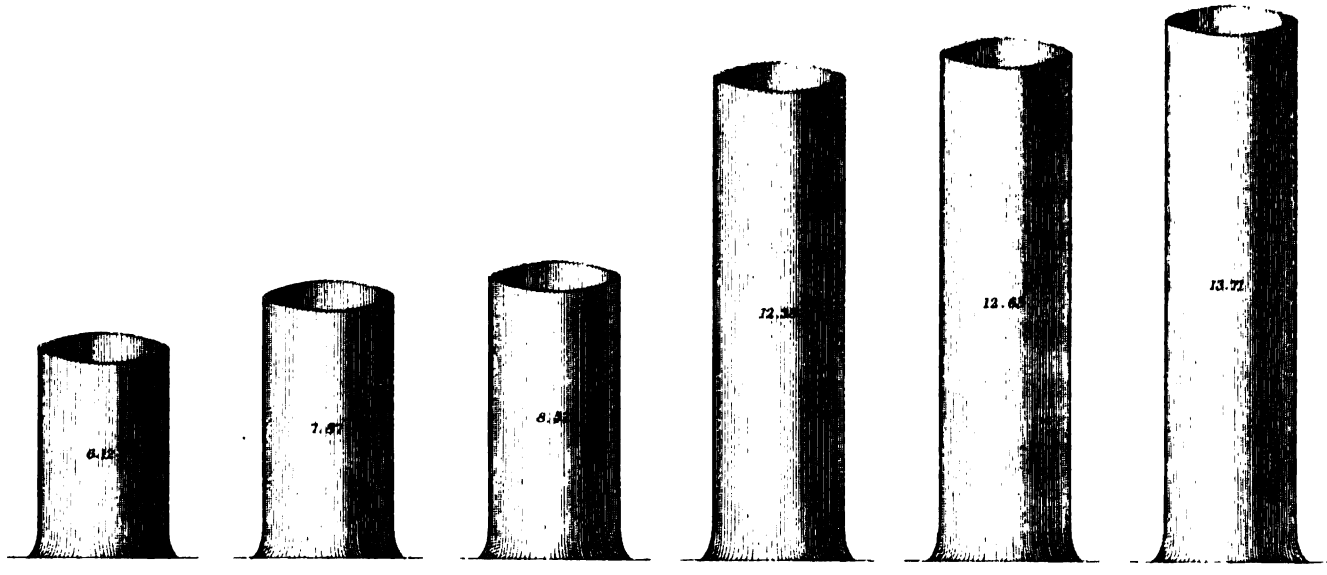

Ayrshire
Hereford
Aberdeen poll
Short Horn
Short Horn Grade
Hereford Grade

FIG 1.

MILK, CREAM & BUTTER TESTS.

SPECIFIC GRAVITY OF MILK FROM DIFFERENT BREEDS OF COWS

Julius Bien & Co lith

CATTLE IMPORTS FROM THE UNITED STATES NOT PROBABLE.

I am not inclined to think that any considerable importation of cattle from the United States is likely to occur, as the only requirement here is for No. 1 thoroughbreds, and the wide-awake shippers are keenly criticising foreign stock, of which, owing to their trans-Atlantic trade, opportunities of making selections from the most famous herds are not lacking.

I have pleasure in attaching to this report a plan of the model stock building, Experimental Farm, Guelph, trusting that it will not be considered extraneous to the subject, and an illustrated test of the milk, cream, and butter producing capacity of several breeds, made by Professor Brown, under the direction of the Ontario Government.

H. C. BUFFINGTON,
Commercial Agent.

UNITED STATES COMMERCIAL AGENCY,
Chatham, October 3, 1883.

Special statistics concerning cattle in Southwestern Ontario.

Name of breed.	Annual average yield of milk.	Milk to pounds of butter.	Milk to pounds of cheese.	Live weight.			Age at maturity.	Weight of meat at maturity.	Color.
				Cow.	Bull.	Ox.			
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Months.*	*Lbs.*	
Canadian	4,800	25	11½	950	1,200	.....	24	950	Variable.
Shorthorn	2,550	22½	12	1,550	.....	1,700 to 2,000	22-24	1,000 to 2,000	Do.
Hereford	2,340	24	11½	1,300	.....	1,500	28	1,300 1,500	Do.
Aberdeen grade	2,380	25	11½	1,300	.....	1,500 1,600	30	1,300 1,500	Do.
Hereford grade	3,570	24	7	1,100	.....	.....	32	1,300 1,500	Do.
Shorthorn grade	2,960	24	11	1,450	.....	1,400 1,800	22-24	1,450	Do.
Devon	2,800	23	16½	1,050	.....	1,200 1,400	25-27	1,000 1,200	Chiefly red.
Galloway	2,470	25½	9½	1,250	.....	1,300 1,500	30-34	1,250 1,300	Chiefly dark.
Ayrshire	5,250	24	11½	1,000	.....	.....	32-36	1,000	Variable.

Name of breed.	Description of breed.	Origin of breed.	Product.			
			Labor.	Meat.	Milk.	Cheese.
Canadian	Small, quick, wiry.	Native stock with perhaps a strain of Durham.	Good	Flesh good but too small.	Fine	Good.
Shorthorn	Good frame; quick grower.	Booth-Bates families.	Fair	Excellent and heavy.	Very fair	Do.
Hereford	Good feeders; plump.	.....	Good	Flesh good; too light.	Moderately good.	Do.
Aberdeen grade.	Well built; not considered hardy stock.	.....	Indifferent	Rather light	do	Very good.
Hereford grade.	Plump and rugged.	Cross	Good	Light but excellent.	Very good	Superior.
Shorthorn grade.	Large; rapid grower.	Cross on native or grade cow.	Strong	Large and good.	Excellent	Very good.
Devon	Small boned and plump; easily fed.	.....	Too small	Fine but light	Good	Indifferent.
Galloway	Thick-set and hardy.	.....	Good	Rather light	Fair	Good.
Ayrshire	Small, clean-limbed, plump.	.....	Fair	Too light	Superior	Do.

Topography: Altitude, very little above the level of Lake Saint Clair, which is about 570 feet above sea-level. Mean temperature for 1882 was 44°. A very small difference is noticeable in a record of thirty years. Mean for June, July, and August, 64.3°; December, January, and February, mean 23.1°.

Soil: Twenty per cent. alluvial; clay-loam, 39 per cent., in some places 3 to 8 feet deep; clay, 16 per cent., 3 to 4 feet deep; 25 per cent. sandy loam and gravelly.

There is absolutely no soil or substratum in this locality which can properly be designated as stony. There is considerable lowland and some marshes not fit for growing grain. Most of the land has a heavy yellow or blue clay substratum; cannot state the per cent., but by far the greater area may be thus classed. A small part of the soil near the lakes is light, and has gravel or sandy soil as a substratum.

Cultivated grasses: Timothy, 40 per cent.; clover, 40 per cent.; grass, &c., 20 per cent. The principal grass crops are timothy and clover, some corn for feed broadcast, and a small quantity of various grasses; large quantities of wheat and oat straw are fed in winter.

Methods of housing, feeding, &c.: Most cattle have run of barn-yard and straw-stacks, and are only housed when being stall-fed. Open sheds (a square usually) afford them good shelter. In some places young stock are badly neglected in the matter of housing (*vide* the plan inclosed). No system of feeding; young stock are allowed to feed themselves, and attention only begins (save with fine animals) when it is intended to fatten them. The most approved breeders cross the best attainable of male thoroughbreds on common or grade cows. No bull is suffered to go to his own progeny. A second or third cross is preferred to a first.

Handling products: No trouble; plenty of buyers, who are always traveling the country to make up cargoes for British markets and local butchers, keep up the prices.

CATTLE IN PRESCOTT, ONTARIO.

REPORT BY CONSUL SLAGHT, OF PRESCOTT.

CHARACTERISTICS OF THE VARIOUS BREEDS.

The production of a superior class of cattle, such as are found among the best herds in this consular district, has been successfully accomplished by a careful selection and use of thoroughbred bulls only, and experience has proved that the Durham and Hereford stand pre-eminent, the Hereford being the larger and capable of attaining to a higher standard in weight as beefing stock. But for smallness of bone and early maturity the Durham is the favorite, and apparently more numerous. The Durham bull is serviceable for breeding purposes at fifteen months. The Ayrshire, or a well selected Canadian cow served by a Durham bull, produces excellent results, giving a high grade of animal, combining most desirable qualities for the dairy and also for beefing stock. It is, however, by good feeding and proper housing that any preference is claimed for the Durham; if the animals are exposed to cold and hardship, or insufficiently fed, the Hereford will surpass his competitor. The cows at present comprising these herds are largely of the Ayrshire strain, and under judicious management the average product of milk per cow is 5,000 pounds during the season, and when made into cheese 10 pounds of milk is required for 1 pound of cheese, 500 pounds of full cream cheese being placed to the credit of each cow in the herd annually. For richness of milk the prize is conceded to the Jersey cow. The special excellence of this herd is maintained by the use of a thoroughbred Durham bull, and 20 per cent. more butter is claimed for this herd from a given quantity of milk over any other herd in this district. The Canadian cow is placed by competent authorities here as having been originally imported from Normandy. These were good milkers, and partook very much in appearance of the Jersey and Alderney breeds. By cross breeding they are now classed at one-fourth

Shorthorn. They are very enduring, and do good service in the dairy, having also fair beefing qualities. The Galloway breed are represented here to a very small extent. These cattle are appreciated more for their labor than for milking or beefing qualities, being strong, hardy animals, with heavy necks and shoulders. The thick covering of heavy black hair which they possess forms a noticeable protection against this cold climate; they are also without horns. Thus protected and unencumbered they appear to be peculiarly adapted for labor in the unbroken forest.

DISTILLERY-FED CATTLE FOR EXPORT TO ENGLAND.

There are 1,200 head of cattle fattened for market annually at this place. They are known as distillery fed, and are placed in the feeding stall in November. Only such animals as are of good frame, three to six years old, weighing at the time 1,000 to 1,100 pounds per head, are selected for this purpose. The daily routine of feeding begins at 6 o'clock in the morning—all the hay they will eat in two hours. At 8 a. m., mash from the distillery, quite thick with meal, is given them. At noon mash again, and at 2 o'clock p. m. hay. At 6 p. m. the troughs are filled with mash, and the cribs with hay, which is an abundant supply for the night. This system of feeding is accompanied with good housing, and produces very choice beef. The usual time occupied in feeding as herein described is from six to seven months, and when these cattle are taken from the feeding stall their weight is 1,500 to 1,600 pounds per head. The valuation on the spot will average $100 each. They are at once shipped to England, and the cost of transportation to Liverpool, including insurance, attendence, and food during the voyage, does not exceed $22 per head. Their valuation in the English markets are from $140 to $150 per head, netting a handsome profit.

The prices for young cattle here are the following: For bulls eighteen months old, $75 to $100; heifers, yearlings, $20 to $30 per head. Such stock is not supposed to be pure, although classed as high grade.

EXPORT TO THE UNITED STATES.

Transportation to the United States by direct and continuous railroad connections at very small cost. The twelve to twenty-four hours occupied in transit from here to prominent marts in the United States dispenses with the additional cost for care and food. Buyers from the United States are constantly in Canadian markets for young cattle. Beeves, however, are seldom exported to the United States from this district.

In view of the important question of profit or loss to the dairyman when the animal passes the age, or for other cause, when it shall cease to contribute profitably to the dairy, attention is then directed to its beefing qualities, and what appears to be most wanted is a grade animal that will attain to the greatest weight in the shortest time, and not be injuriously affected by a change in food or climate. These desirable qualities may be fully relied upon as characteristic of the Durhams and Herefords. Therefore it is my humble opinion that these are the best breeds to export to the United States.

HARRY L. SLAGHT,
Consul.

UNITED STATES CONSULATE,
Prescott, April 8, 1884.

General statistics.

Name of breed.	Annual average yield of milk.	Milk to pounds of butter.	Milk to pounds of cheese.	Live weight.		
				Cow.	Bull.	Ox.
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*
Ayrshire	5,000	25	10	900	1,500	1,400
Durham	5,000	25	10	1,100	1,600	1,700
Hereford	5,000	25	10	1,100	1,600	1,700
Jersey	6,000	16	(*)	800	1,300	None.
Canadian	4,000	25	10	900	1,500	1,400

Name of breed.	Age at maturity.	Weight of meat at maturity.	Color.	How long bred pure.	Origin of breed.	Product.		
						Meat.	Milk.	Cheese.
	Years.	*Lbs.*		*Years.*				
Ayrshire	5	600	Red and white	7	Scotland	$28 00	$30 00	$35 00
Durham	4	800	do	5	England	35 00	30 00	35 00
Hereford	5	800		8	do	35 00	30 00	35 00
Jersey	4	None.	Fawn	10	Island of Jersey	None.	†150 00	None.
Canadian	4	600	Red		Normandy	28 00	30 00	25 00

* None made. † Milk and cream.

Annual increase, 10 per cent.; for the dairy, 75 per cent.; for the butcher, 25 per cent. Excess of home demand exported to England and United States.

Topography: Altitude, 300 feet; mean temperature, 42.31°; summer, 66°; winter, 18.44°. Soil: One-half loam, one-fourth clay, and one-fourth sandy, &c. Substratum: One-third limestone, one-third granite, and one-third gravel, &c.

Cultivated grasses: Two-thirds timothy and one-third clover.

Methods of housing, feeding, &c: Wooden stables; a stall for each animal. They are cleaned and carded daily. Good beds, sawdust being freely used as an absorbent. Grazing in summer; hay, oatmeal, and barley meal in winter; salt three times a week. Calves come into profit at fifteen months to two years of age. Very little butter exported from this district. Local demand for milk and cream is large. Raising of calves is extensively engaged in. Cheese is exported.

CHEESE DAIRYING IN HASTINGS COUNTY, ONTARIO.

REPORT BY CONSUL PRINCE, OF BELLEVILLE.

CATTLE AND THEIR IMPORT AND EXPORT.

There are very few pure-bred cattle in this district. I could find but two or three persons who made any pretensions to raising a better than ordinary grade. There are now, however (having been introduced within a few months past), several fine Durhams and Ayrshires, claimed to be absolutely pure, and a movement is being made for the introduction of some other breeds, and more interest in and attention paid to the breeding of pure stock, all of which, in the future, will materially change the character of the cattle here.

I find that in the county of Hastings, comprising the largest part of my district—population nearly 50,000—the census returns show live stock as follows:

Cattle	31,985
Hogs	10,534
Sheep	22,268
Horses	11,473

The cattle are mostly Shorthorn grades and common Canadian, the "grade" and Canadian, so called, being the greater proportion, probably nineteen-twentieths. None are raised or bred here for export. The most of them are of a small size, some, when crossed with the Ayrshires, weighing less than 1,300 pounds. The purer the breed the heavier the stock. Few are slaughtered for market—merely sufficient for the ordinary home demand—the cattle being of light weight. The heavier meats come from districts west. None are drawn from the United States, nor are any exported thither of any importance. Such as are exported go to England. I find that in the last five years not over $20,000 worth of cattle have been sent to the United States from this district, and these at long intervals and of ordinary grades.

CHEESE MAKING.

The main interest here in this connection is the dairy—the entire product in fact going to the cheese factories. The yield is about $28 per animal, on the average, over and above what is used in the family, though in one instance a party who has a fair herd of Durhams and Ayrshires says his yielded him $40 per season for each cow over and above such as he used for his own family.

I have analyzed the returns of three of the principal cheese factories, and I find as follows: Milk to each pound of cheese, No. 1, 9.602 pounds; No. 2, 9.870 pounds; No. 3, 9.510 pounds.

Paid each patron or stockholder, per standard (of 3,000 pounds) of milk, which is supposed to represent the average season's milking: No. 1, $28.37; No. 2, $26.49; No 3, $30. The average price for cheese was about 9.90 cents.

I was unable to find any one who kept such accounts as would enable him to get at the product of his cattle in other directions, labor, meat, &c., or for the balance of the year. As stated, the main volume of the product goes to cheese.

The northern portion of this county (Hastings) is admirably adapted for grazing, and the beef and mutton and butter and cheese are of a better quality than the southern. The water in the northern (Lawrentian) portion is pure, while that of the southern (Silurian) district is very hard.

FRED'K W. PRINCE,
Consul.

UNITED STATES CONSULATE,
Belleville, December 15, 1883.

Special statistics of cattle in the Belleville district.

Breed.	Color.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Live weight.	Weight of meat at maturity.	District.
		Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	
Durham	Red, and red and white.	22½ to 24	9½ to 9⅝	1,400 to 1,500	800 to 900	Belleville.
Ayrshire	do	22½ 24	9½ 9⅝		800 900	Ontario.
Ordinary grade.	White and red	24 25	9⅝ 10	1,300 1,400	600 700	

Remarks.—The yield of milk during the "season," as called, at the cheese manufacturers, averages 3,000 pounds; for exceptional cases in pure breeds (see report herewith), 4,000 pounds. Until quite recently, say two years, very few absolutely pure

breeds in district. There are but the two crosses from Durham and Ayrshires in this district. The milk all goes to the cheese factory, except such as is used in the family. From pure-bred stock, $40 per season has been realized; the average, as indicated by cheese factory returns, is $28. The Durham matures at three years of age.

Topography: The southern portion of this district is from 250 to 1,300 feet above level of the sea; the northern from 500 to 2,000 feet. Mean temperature, 47.7°; highest (September), 98°; lowest (February), 16°. Soil: Alluvial, loam, and clay; sandy in patches only. Substratum: Southern portion of district, Silurian limestone; northern, Huronian and Laurentian granite; bowlder clay in small portions. Timothy and clover are the cultivated grasses.

Housing, feeding, &c.: The cattle are housed in inclosed sheds. During the milking season roots are the feed; when not, dry straw and grain once a day.

CATTLE IN THE CARLTON COUNTY, ONTARIO.

REPORT BY COMMERCIAL AGENT ROBBINS.

The consular district of Ottawa embraces a large extent of country, with a great variety of soil and climate; but for the purposes of this report I shall confine my investigations to the county of Carleton, of which Ottawa is the county seat.

TOPOGRAPHY.

As the published official reports fail to show the mean temperature of Ottawa I have selected two of the nearest stations, viz, Pembroke and Cornwall. Pembroke is west and north and Cornwall south and east of Ottawa, and the results given below will indicate the temperature of this district.

Mean temperature in each quarter of the year 1881.

Stations.	Winter.	Spring.	Summer.	Autumn.	Year.
	°	°		°	°
Pembroke	15.2	51.9	67.4	33.5	42.61
Cornwall	17.7	52.5	67.4	33.4	42.50

SOIL.

The soil of Carleton County varies in the several townships, but clay, sandy and black loams predominate. In this immediate vicinity there is a good deal of limestone rock. All the cultivated grasses do well, timothy and clover being the ruling classes. Of the improved land, about one-half is reported as first class for agricultural purposes; about one-quarter second class, and the remaining quarter third class. There is considerable swampy land as yet unredeemed, as also a good deal of land so rocky as to be unfit for profitable cultivation. The county is generally well watered.

AVERAGE PRODUCTION.

The average production of grain, &c., is reported as follows: Fall wheat, 20 bushels per acre; spring, 15 bushels; barley, 30 bushels; oats, 35 bushels; rye, 20 bushels; peas, 20 bushels; corn, 25 bushels;

potatoes, 150 bushels; turnips, 450 bushels; other root-crops, 420 bushels; hay, 1 ton per acre.

ALTITUDE.

Ottawa Harbor, at foot of Rideau Canal, in the city of Ottawa, is 121.75 feet above tide-water mark at Three Rivers, a point midway between Quebec and Montreal, and from which official measurements are taken.

EXPLANATION.

The foregoing figures are taken from official reports, and the following are based upon results derived from actual experience had and experiments made with the different grades of cattle in this county, secured (by personal interview) from cattle raisers and experts, and which are believed to be reliable:

Special statistics concerning cattle in the Ottawa district.

Name of breed.	Sex.	Age at maturity.	Size at maturity.	Weight at maturity.	Color.	How long bred pure.	Origin of breed.	Average pounds of milk daily from March 1 to November 1.	Average pounds of butter daily from March 1 to November 1.	Milk to pounds of cheese.
		Yrs.	*Feet.*	*Lbs.*		*Yrs.*		*Lbs.*	*Lbs.*	*Lbs.*
Durham	Bull	5	5½	2,000	Red and roan.	25	England	.....	.....	.....
	Cow	4	4½	1,400 to 1,600	....do	25	....do ...	20	¾	12
Devon	Bull	5	4	1,500	Red.....	7	....do ...	.....	.....	.....
	Cow	4	4	1,300 to 1,400	....do	7	....do ...	18	1	12
Ayrshire	Bull	5	4	1,500 to 1,600	Roan	25	....do ...	.....	.....	.....
	Cow	4–5	4	800 to 900	....do	25	....do ...	20	1	12
Cross between Durham bull and native cow.	Cow	2–3	4½–5	900 to 1,000	Red and roan.	.....	Canada.	20	1	12
Common or native.	Cow	2–3	4	800 to 900	All colors....	.....	....do ...	25	¾	12

CONCLUSIONS.

There are a few Jerseys and a few Galloways in this district, but of the pure bloods the Durhams are the favorites. According to my best information the predominant class of cattle in this district is a cross between the Durham bull and common or native cow; they mature early, are good feeders, hardy, excellent milkers, of fair size, good beefers, and hence profitable.

The friends of the Devon claim that equally good results follow from the cross of a Devon bull with the native cow, and, as a matter of fact, all crosses of the pure bloods with the native cow greatly improve the stock. She seems to have the power and habit of perpetuating the character of her male consort rather than her own. Especially is this the result of the first cross, but which is not so marked or distinctive in subsequent issues.

R. B. ROBBINS,
Commercial Agent.

UNITED STATES COMMERCIAL AGENCY,
Ottawa, October 3, 1883.

CATTLE IN THE SIMCOE DISTRICT.

REPORT BY COMMERCIAL AGENT JAMES.

The principal breeds of cattle here are the Durhams and the Durham grades, and some Ayrshires to a limited extent. The best method of exportation, and the one mostly followed, to the United States from this section is by rail to Buffalo, and to the old country they go principally by rail to Montreal and Quebec, thence per steamer. The animals mostly exported are Durhams or Durham grades, on account of size of carcass. The prices of fat cattle vary according to demand, bringing from 3 to 5 and 6 cents per pound, live weight. For thoroughbreds the prices range from $100 to $1,000, and often prices that seem fabulous. The number of cattle in the county of Norfolk, Ontario, in which my district principally lies, is somewhere in the neighborhood of 25,000, the largest percentage of which are grades. About 40 or 50 per cent. are bred for the dairy. The stock, I think, has slightly decreased, owing to the shipments to the United States and the old country. The supply is in excess of the home demand. As regards the breeding of thoroughbred Durhams it is found that animals of superior breeding are raised here, and are annually bought up at very large sums and exported, and have been able to carry away prizes from those bred at home. I have had all the answers, as far as possible to obtain them, given in the inclosed lists, and trust that such may prove satisfactory.

HENRY M. JAMES,
Commercial Agent.

UNITED STATES COMMERCIAL AGENCY,
Simcoe, December 7, 1883.

Special statistics concerning cattle in the Simcoe district.

Name of breed.	Average yield of milk per day.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Live weight.			Age at maturity.
				Cow.	Bull.	Ox.	
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Years.*
Durham and Durham grade	30	25 to 30	10	1,200	2,000	1,600	4 or 5
Ayrshire	25	25 30	10	900	1,600	.....	5 6

Durham and Durham grade: These are large stock, of red or roan color; originally from England, and have been bred pure for many years. Weight of meat at maturity s about one-fourth less than live weight. In Durhams the following strains are good milkers: "Isabellas," "Rose of Sharons," and "Sanpariels," and in grades any of their issue.

Ayrshires: This breed is of medium size, red and white in color; originally from Scotland, and have been bred pure for many years. Weight of meat at maturity one-fourth less than live weight. They are good milkers, and excellent for butter and cheese.

This district is in Norfolk County, Ontario.

Topography, &c: Altitude: 140 feet above Lake Erie, or from 700 to 716 feet above sea level. Mean temperature: 1875, 43°.2; 1876, 46°.4. Soil: One-half sandy and clay, one-eighth clay, and three-eighths sandy, &c. Substratum: One-eighth limestone, three-fourths clay and sand, and one-eighth gravel, &c. Timothy and clover are the cultivated grasses.

Housing, feeding, &c: Cattle are generally kept in stalls in stables. Cut hay and straw with chop, &c., and roots, such as turnips, mangels, and beets are fed. They are either thoroughbred, or in case of grades bred to thoroughbred bulls.

PROVINCE OF QUEBEC.

CATTLE-RAISING IN QUEBEC.

REPORT BY CONSUL PARKER, OF SHERBROOKE.

INTRODUCTORY.

I have the honor to transmit herewith such answers to the inquiries made by the Department of State relative to the various breeds of cattle, amount and quality of products, and the methods of handling and disposing of the same, as I have been able to glean from the breeders and dairymen and stock-growers of this portion of the province of Quebec. I am aware that in many particulars the report is incomplete, and that in others results are only approximated. But I have found considerable difficulty in securing even the limited information thus compiled.

A few general observations will, I think, serve to give a better understanding of the cattle industry in the Eastern Townships of the province of Quebec, and of such features thereof as may be of interest to the herdsmen and farmers of the United States than any tabulated statement can do.

THE NATIVE OR FRENCH CATTLE.

The native, or French cattle, as these are called, form the basis upon which the various crosses with the imported breeds are made. These cattle are not large, but they are hardy, light eaters, and yield fair quantities of good, rich milk, well calculated for profitable use in the manufacture of butter and cheese. Cattle-breeders who have given the subject careful attention are of the opinion that these native cattle, which were introduced by the early French colonists, belong to the great Channel family and are nearly related to the Jerseys and Guernseys.

THE BEST DAIRY CATTLE.

Senator Cochrane, who owns and operates at Compton, near Sherbrooke, the best appointed cattle-farm in Canada, possibly, excepting the great Government establishments at Guelph and Rougemont, has found by long experience with the best-known breeds that the Jerseys are by far the most profitable and best suited to this climate of any of the highly-bred cheese and butter producers. The offspring of Jerseys crossed upon the native Canadian stock are better for ordinary farm use in places where good shelter and thorough care in winter are not always attainable. But good results can only be secured here by properly housing and feeding stock during the long, cold winters.

CLIMATE OF QUEBEC.

In a climate where the mercury often sinks to 25 and 30 degrees below zero, and occasionally to 40 degrees below, the importance of proper shelter and food must be fully realized.

CATTLE FODDER IN QUEBEC.

The seasons being too short for corn to mature other food products must take its place. Among these hay and roots are the principal.

The country produces timothy, clover, and red top, or herd grass, in great abundance. Before the development of the cattle industry, immense quantities of hay were exported to the United States. But now much of the hay crop finds a market with the cattlemen, and the shipments from this immediate locality show a corresponding decrease. The best roots are the white Swede turnips, sugar-beets, and carrots; the turnip being the favorite. For young cattle these are boiled, pulped, and mixed with chopped clover, hay, and either oil cake or cotton-seed meal; while they are sliced or fed whole to mature animals. This is, of course, on well-managed cattle ranches; among ordinary farmers they are simply fed whole in connection with hay. It is probable that Canadian cheese and butter owe more of their excellent quality to this diet of rich and succulent roots, and to one other cause, than to the peculiar breeds of the milch cows that yield the milk and cream from which they are made. The one other cause is the frequent rains during the summer and fall, which keep the grass always green and tender until the frosts kill it down.

THE MOST SUITABLE BREEDS FOR QUEBEC.

The Canadian minister of agriculture (Mr. Pope) is also largely engaged in breeding fine cattle at Cookshire, in this consular district, and the Dominion Cattle Company, of which Hon. W. B. Ives, member of Parliament for the counties of Richmond and Wolf, is the manager, has its headquarters here. Besides these there are other breeders of thoroughbreds, and a great many extensive raisers of good-grade stock for the butchers and exporters. The united testimony of all these tends to the conclusion that the Polled Angus or Aberdeen stock and the Herefords are the best calculated to produce good beef cattle in this climate. They are hardy, large, mature early, and their meat is of the best. Breeders also regard them as much the best for crosses with the native grades here, and under certain circumstances, in the South and West also.

THE JERSEYS VS. NATIVE FRENCH CATTLE.

As before remarked the Jerseys and Jersey crosses with native cattle are most popular here for dairy purposes. Mr. Cochrane and other breeders of large experience regard them as being, in many respects, superior to the Guernseys, Ayrshires or Devons. The ease with which they are kept in good condition and the richness of their milk are the points urged in their favor. Some breeders have, at times, cherished preferences for the Guernseys on account of their superior weight, but further experience has taught them that their inferiority to either of the three great beef-producing breeds is too palpable for them to be regarded with favor for butcher's stock, while their smaller yield of milk and butter will not permit them to become rivals to the Jerseys for dairy purposes.

It would not be fair to the native stock of cattle to fail to add here, that in the qualities required for the farm dairy, the Canadian cattle, even without the benefit of favorable crosses are really strong. They are thoroughly acclimated, give fair quantities of milk, and the yield of butter and cheese is good. A competent dairyman estimates that the average Canadian cow, with ordinary treatment, will yield 5 quarts of milk daily for at least six months in the year, after which it will slowly fall off.

DISPOSITION OF CATTLE AND CATTLE PRODUCTS.

As to the disposition of products, beef cattle are largely consumed at home. The people of this section of Canada make use of a great deal of meat, mostly beef and mutton, pork being used comparatively little. Large numbers of fat cattle are shipped to England and Scotland, and a small number reach the markets of the United States.

Butter is made by the families of farmers, and either printed or made into rolls for the local trade, or packed in tubs for exportation or to supply the home markets during the latter part of the winter and the early spring months, when the cows are mostly turned dry. Cheese is made by farmers' families and in small factories, and sold to local dealers or to exporters. Much Canadian butter and cheese reaches the markets of New England, its superior quality enabling shippers to pay the duty of 4 cents per pound to the American Government, and still find ready and often profitable sales among our people. The shipments of Canadian butter and cheese to England and Scotland, where they are highly prized and bring fairly remunerative prices, have been growing larger year after year, and in the last three years have doubled annually.

CONCLUSION.

I have thus endeavored to present the opinions of the stockmen and dairymen of this section of Canada, and the results of their varied experiences—gleaned from numerous conversations and interviews with them—uncolored by any notions of my own. I sincerely hope that the record may contain something of value to the stock growers and farmers of the United States.

BENJ. S. PARKER,
Consul.

UNITED STATES CONSULATE,
Sherbrooke, December 19, 1883.

Special statistics concerning cattle in the eastern townships of Quebec.

Name of breed.	Annual average yield of milk.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Live weight.		
				Cow.	Bull.	Ox.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Canadian	1,600 to 1,900	10	5	700 to 1,200	900 to 1,500	800 to 1,400
Shorthorn				1,200 1,800	1,800 2,400	1,700 2,400
Hereford				1,200 1,800	1,800 2,400	1,600 2,300
Polled Angus or Aberdeen				1,200 1,800	1,800 2,400	1,600 2,300
Jersey	2,000 to 2,400	9	5	700 1,100	900 1,300	800 1,800

Breed.	Age at maturity.	Weight of meat at maturity.*	Color.	Origin of breed.
	Years.	*Pounds.**		
Canadian	3	700 to 1,500	Fawn, roan, spotted	Supposed to have been in the Channel Islands.
Shorthorn	2	1,200 2,400	Red, roan, white	England.
Hereford	2	1,300 2,400	Red and white	Do.
Polled Angus	2	1,200 2,400	Black	Scotland.
Jersey	2	700 1,300	Fawn	Island of Jersey in the English Channel.

*These are gross weights; subtract at least one-fourth to obtain net weights.

Topography, &c.: Altitude, 500 to 1,050 feet above sea-level; mean temperature (estimated), 35° above zero; summer, 60° above; winter, 10° above. There are no records kept here except those kept by the Grand Trunk Railroad. I did not know this in time to secure correct figures from the Grand Trunk general office at Montreal. The soil varies in different localities so that it is fairly correct to designate mixed, loam, clay, and sand, in equal proportions.

Cultivated grasses are timothy, clover, and red top.

Housing, feeding, &c.: The cattle are kept in stalls and loose boxes on ground floors of barns and sheds. Special care is taken on the breeding farms for thoroughbred stock. Cattle are housed in basements of main barns with hay and straw in lofts, root cellars near at hand, &c. The feed consists of hay, turnips, corn, barley, oatmeal, bran, oil-cake, cotton-seed meal, &c. Timothy hay fed whole, but clover hay chopped and mixed with pulped turnips, also with meal, bran, and oil-cake for young stock. Roots fed whole or sliced for mature stock. Good grade cattle are made by crossing Shorthorns, Hereford, or Polled Angus on to native Canadian stock. The best dairy stock is pure Canadian or pure Jersey or crosses of the two. Much care is taken by breeders to keep their strains pure. Much of the beef products are shipped alive to England and Scotland and much is consumed at home, while a fair per cent. goes to the markets of the United States. Beef cattle are generally well handled. Much butter and cheese is produced. The cheese is exceptionally good and the butter about equal to the average butter of the United States.

CATTLE IN THE GASPE BAY DISTRICT.

REPORT BY CONSUL HOLT.

Little attention has been given to the improvement of the breed of cattle on this coast, consequently they are small and inferior, and of no value to those who are interested in the selection of animals for breeding purposes. They consist mainly of mixed breeds from Polled cattle from the Magdalen Islands, and Jerseys and Canadian, of an average live weight of from 4 cwt. for the cow to 6 cwt. for the ox, and yielding about 100 pounds of butter per cow annually.

GEO. H. HOLT,
Consul.

UNITED STATES CONSULATE,
Gaspe Basin, October 6, 1883.

CATTLE IN PRINCE EDWARD ISLAND.

REPORT BY CONSUL WORDEN, OF CHARLOTTETOWN.

I have the honor to forward herewith the form which accompanied the cattle circular of July 18, 1883. Many causes have operated to hinder its compilation, and now it is with considerable doubt as to its availability that I send it to the Department.

It is only within a few years that the farmers of this province have begun to comprehend the advisability of improving the native cattle by importations from England.

A farm was purchased by the local government some years since, and a number of pure and well-bred cattle put upon it. Their progeny have, from time to time, been sold at auction, and gradually the grade of the cattle now bred on the island is being improved. This farm is maintained at the expense of the local government. No pains are taken to give the farming community the advantage of the stock raised. At present the character of the stock is not equal to that of Ontario,

but, from observation, I consider it superior to the general average of Quebec.

I doubt if the feeding of cattle receives the same amount of care that is given to the system in Ontario. During the summer the island is admirably adapted for grazing, and it seems as though a trade in cattle with the United States might be of as much importance as is the trade in the other products of the province. The Boston market would seem to present a favorable opening for this branch of industry. At present no cattle are sent to the United States from this consular district. A few buyers of sheep and lambs find their way to the island.

W. A. WORDEN,
Consul.

UNITED STATES CONSULATE,
Charlottetown, Prince Edward Island, August 7, 1884.

Special statistics concerning Prince Edward Island cattle.

Name of breed.	Annual average of milk.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Live weight.			Weight of meat at maturity.
				Cow.	Bull.	Ox.	
	Pounds.	*Pounds.*	*Pounds.*	*Lbs.*	*Lbs.*	*Lbs.*	*Pounds.*
Shorthorns	8,000	30	10	1,400	1,800	1,600	800
Ayrshires	5,800	.....	.....	1,000	1,400	1,400	600
Grade Shorthorns	6,000	.....	.....	1,300	1,700	1,500	780
Other grades (crossing between the Ayrshire and Guernsey bulls and the native cows)	5,500	.....	.....	1,000	.....	1,300	600

Remarks: The Shorthorns are well shaped; colors, white, roan, and red. They were originally imported from England, and have been bred pure seven to twenty-five years. The Ayrshires and Grade Shorthorns are similar to the Shorthorns, except that they are of mixed colors. Other breeds are of mixed colors, medium shape, and have been bred pure for one hundred years; origin not known.

Topography, &c.: Altitude, 36 feet. Mean temperature, 39.33°; summer, 47.58°; winter, 31.07°. Soil: Loam, clay, and sand. Substratum: Sandstone, clay, and gravel. Cultivated grasses: Timothy and clover.

Housing, feeding, &c.: The cattle are kept tied up or in loose boxes during winter of six months. Hay, timothy and clover, roots; turnips, mangels, potatoes, grain, oats, and barley are fed. Grain is housed or stacked, and thrashed in barns; hay chiefly housed.

MEXICO.

CATTLE-BREEDING IN NORTHERN MEXICO.

REPORT BY CONSUL-GENERAL SUTTON, OF MATAMOROS.

Preliminary.—A detailed and reliable account of the breeding-cattle in Northern Mexico, as called for in the circular and memoranda, is a very difficult task. No previous data being available, I have had to visit the "ranchos" and inquire directly of "rancheros." Having selected the cattle I desired, they were photographed, measured, and weighed, and as full a description given as possible.

Origin.—In all the histories of Mexico and of individual States which I have examined, they are spoken of as the cattle of the country descended from those brought over by the Spaniards.

Breeds.—Roughly speaking, there is only one breed, but in this there are variations, showing that at least three breeds were originally imported, the Longhorns, the Shorthorns, and the Polled cattle.

In Northern Mexico the first is the most common, and is, so to speak, the general class. In the same herds with the Longhorns are to be found a considerable number of shorter-horned cattle, and occasionally a few Polled cattle. The first are very large-boned, immense, gaunt beasts. The Shorthorned are a little shorter and broader. The Polled cattle are nearly like the Longhorned in general build.

Uses.—These cattle, as a whole, are only good for and only used for, beef and labor. Milk and cheese are only made in small amounts for local consumption.

Milk.—In this city cow's milk is sold along with goat's milk, and rather exceeds the latter in quantity. In most of the other cities and towns of Northern Mexico, cow's milk is usually scarcer and more goat's milk is used. The increase of foreign population has increased the demand for cow's milk. I know of no attempt to increase the milk-producing qualities of cows. The cows are "corraled" at night, milked in the morning, and herded during the day on the open pastures.

A fair average cow will give about 4 quarts of milk per day for three months. After three months the amount diminishes and the quality deteriorates, so that milking is finally stopped at about six or eight months after the calf was dropped.

The milk in good seasons seems to produce a light cream, and is reasonably good if got pure and clean. Venders of milk sell it at so many cupfuls for 6 cents. The number of cups varies with the season, but the price averages from 5 to 15 cents per quart. It lacks the taste and quality found in good American cow's milk produced from the rich and juicy grasses in the United States.

Butter.—Butter making is almost unknown, although there are some "ranchos" up-river where American "rancheros" have dairies and make considerable butter for local consumption.

Cheese.—A small amount of a sort of cheese is made and has a limited sale. It is usually made into round flat cakes weighing about a pound. It resembles what is locally called "Dutch cheese" in some parts of the United States. The general get up of the article was not inviting

enough to encourage me to take a second taste. In general it may be said that while there are thousands of cattle within sight, a glass of milk is a difficult thing to obtain, and butter and cheese are unknown.

Variations of breed.—On the lowlands the cattle grow larger. The hoofs spread out, the limbs are thicker, the horns are longer, and the animals generally adapt themselves to their surroundings. In the high regions the hoofs are smaller and tougher; the animals are agile, sure-footed, and very hardy.

Colors.—In all this region the colors are numerous. Perhaps red is the most prevalent color, with black next. Besides the plain colors, are the spotted or "paint" cattle. Some cream-colored cattle have very beautiful glossy hair.

Grasses, &c.—All these cattle run wild, and feed the year round on the wild grasses and bushes. The grasses are very numerous. In this State the most common is the mezquite grass. Besides this are the gama grass, buffalo grass, bunch grass, zacahuizte grass, Bermuda grass, and a large number of others. After a rain, fifteen or twenty varieties are often found along the road within a short distance.

Other foods.—Besides the grasses, cattle feed upon the leaves and beans of the mezquite bush or tree (*Algarobia glandulosa* of Gray). These beans are very fattening. The nopal and other varieties of the cactus are also utilized in certain seasons as food for cattle. In some cases these are gathered in piles, and most of the thorns burned off, so that the cattle can eat them more readily.

Water.—Water is afforded by the various lakes, rivers, and pools. The value of a pasturage is largely dependent upon the amount, location, quality, and permanence of the water supply. In this State, particularly near the Gulf or river, are in the rainy season large lagunas of fresh water. Some of these remain through the longest drought. In the higher country water is scarcer, and in dry seasons many cattle die from lack of water. Rivers in Northern Mexico are comparativeiy scarce, and the lakes are still scarcer. This is a condition which obtains all over Mexico, and, as the rainfall is not evenly distributed through the year, renders irrigation necessary for agriculture. Sufficient moisture for grass and water for stock is often unattainable and renders stock-raising on many otherwise fine pastures very hazardous.

Tanks.—In some sections, dams have been constructed across *arroyos* and other depressions in the soil where the water is held in reserve. To some of these the cattle come long distances to drink. It is thought that this system of tanks would, if properly carried out, bring much idle land into use. In Texas, Capt. Richard King, of Santa Gertrudes, Nueces County, who has one of the largest stock "ranches" in the world, has made a large number of these tanks with excellent results. Either from their effect, or from other causes, Captain King thinks that in his section, between the Nueces and the Rio Grande, the rainfall is increasing and becoming more evenly distributed. With this change he also notes the advance of the mezquite bush, which now partially covers hundreds of thousands of acres which, ten or fifteen years ago, were open plains. The same changes, though less marked, are noticed in the lowlands of this State.

IMPORTS OF IMPROVED STOCK.

In this State I learn of one importation of some twenty head, mostly Durhams, with a few Jerseys. The importer informs me that he cannot as yet give any reliable statement of the results. A very few improved

stock are reported by Consul Scott, of Chihuahua, as having been imported into that State. I have heard of a few other importations along the frontier.

METHODS OF BREEDING.

Cattle graze on the plains the year round. Generally they keep pretty close to one portion of the range, changing somewhat with the time of the year and the supply of water and pasture.

Bulls.—The bulls run with the herd all the year. Calves are dropped all the year round, but most generally in March, April, and May.

The bulls serve cows at eighteen months, but are most effective from three to six years. After that age they get so heavy that they are not so serviceable. They are then castrated, and broken to the yoke or killed for beef. The bulls are not usually changed from herd to herd, and hence breed in and in, to the great deterioration of the stock.

When full grown and ten or twelve years old they are very large, very wild and fierce. A few are used for bull fights during fairs and find their way to the slaughter-house afterwards. To illustrate the disposition of the wild bulls it is stated that south of Soto de la Marina, in this State, some roads are at times impassable, because the bulls attack anything which comes in their way.

Oxen.—Bulls and oxen are used indiscriminately for work purposes. One of each are often yoked together The males are not castrated until two or three years old. The "rancheros" think that they grow larger and faster by this method. They are often simply twisted or pounded. As a result they are usually very staggy in appearance and, as their final destination is the slaughter-house, the term "bull beef" comes home to those who eat beef here with peculiar force. The horns of oxen are longer than those of bulls and often reach a great length. They are very strong, hardy animals. They are worked with a yoke made of a straight stick of wood, in which are cut slight curves for the neck. These sticks are lashed to the head and horns by means of raw leather thongs. The pole of the two-wheeled cart is lashed directly to the yoke stick. They are guided by a driver who goes in front and carries a long pole with an iron brad in the end. This he usually allows to rest behind him on the yoke. He accelerates their pace by punching the offending ox. A turn is made by punching one animal in the ribs and striking the other over the head. A full stop is made by hitting both over the head and getting in their way, kicking their noses, &c. They will usually stand patiently so long as the goad is resting on the yoke in front of them. In muddy weather or on the road they are guided from the cart by punching, hitting, and the voice.

Cows.—Heifers take the bull at about two years of age and cows usually drop one calf a year in March, April, or May. The calves run with the mother until she turns them off, occasionally returning to take a share of the milk supply for the next calf. With good years, when the grass and water are abundant, the average annual increase in a herd is about 66 per cent. Droughts or hard winters will reduce this increase. Cows are never milked except near towns or where a few are selected from a "rancho" to supply the milk needed. These are then milked daily, with or without the calves, for a few months, then turned out and their place supplied with fresh ones. Many of these cows grow to an immense size, and the horns are as long or occasionally longer than those of the oxen.

Branding.—A very important proceeding is the branding, which occurs generally in the months of November, December, and January.

Julius Bien & Co. Lith.

Mezquite posts are set upright so as to make a large "corral," into which the animals are driven by horsemen who have rounded them up. These are very interesting occasions. One set of horsemen bring up one herd, and by dint of shouts, lassos, &c., finally secure them in the "corral."

All those which have no brands are lassoed, led out, thrown down, and branded with the owner's mark. This brand is usually some letter or letters of the name, but is often only a design. The idea is to make a mark, usually on the left side or hip, which cannot grow out or be blurred or obscured by another brand. Besides the main brand is an ear brand, and some cut is usually made in the ear.

When sold many sellers round up the cattle and add another or selling brand. All these brands are matters of record. Cattle cannot be moved from one district (in Tamaulipas) without inspection.

When sold the seller invariably gives a written bill of sale, on which the brands are "painted" or rather written. To illustrate more fully the appearance of the cattle after branding I give herewith some specimens of such brands on file in this office.

Wild cattle.—Besides the cattle which are regularly guarded and which are comparatively tame there are in the southern part of this State many cattle belonging to large "ranchos" which are absolutely wild. Many of these are never branded, are fierce, and roam about in their section unmolested by man. A very intelligent gentleman who has a large ranch in that portion of the State estimated that there might be 50,000 such animals in this State.

Castrating.—With a few "rancheros" the castrating is done when the stock are branded, but the great majority leave this until they are three years old. In other cases they are "twisted" or pounded. It is claimed that a worm causes some trouble when stock are castrated, but this is denied by the most intelligent stock-raisers. The latter tell me that there is no danger in castration, and that it should be done at six months, and that this method gives a better growth, finer stock, and much better beef.

Quality of beef.—The beef is dark red, and when reasonably fat is juicy and fairly tender. As beeves are never fed even for slaughter, and as so much is bull beef or very staggy, it is not so good as it might easily be made. In hot weather the beef is very watery and the weight of the carcass is greatly diminished by drying after slaughter.

Near Soto la Marina the beef is said to be finer than at any other point in Mexico. The grasses are particularly nutritious and abundant, and the prevalence of salt in the atmosphere keeps the stock in good health and gives a finer taste to the meat.

Retail prices.—The prices vary in different cities and in different seasons. In this city (Matamoros) where some fourteen are killed daily, the price of the carcass is about 5 cents per pound Mexican coin, and beefsteak, say, 10 cents American coin.

How beef is sold.—Most of the beef is cut into thin strips, the bone being left out. Formerly a roast or steak could only be bought by previous arrangement, so that it would be properly cut. The American idea has, however, prevailed, so that one can now get meat properly cut for steak and other purposes. More than half is still sliced off into thin strips to be dried for future use. All the stands in the market have the price per pound printed above. This price is regulated by the city which owns the market building and rents the stands. While the price is thus fixed very few if any buy by the pound. The buyer picks out what he wants and negotiates to see how large a piece or how many slices he can

get for 12½ or 25 cents. A small piece is almost always thrown in as a "pilon" or gift. The meat not sold is sliced, salted, and hung out to dry in the sun.

Beef at various ages.—From six months to three years the beef is comparatively good and tender. From three to seven years it is very tough. After the seventh year it again begins to grow tender, and is at its best in the fourteenth year.

Age.—Cattle mature at five or six years but continue to fill out a year or two longer. With fair care cattle live fifteen to eighteen years. They rarely live more than twenty years.

VALUE OF MEXICAN CATTLE FOR THE UNITED STATES.

Breeding cows.—The chief value of these cattle, so far as regards the United States, is in the cows. These when exported to the plains of Texas and the West make the basis of the finest herds in the world. As I stated in a recent report (see Consular Reports No. 31, July, 1883), these cows breed very rapidly and surely. They and their descendants retain the large size and red color of meat. They grow rapidly, are hardy, wild enough to be good "rustlers," and the second cross with good bulls makes the best grass-fed beef that goes into our Eastern cities. The first thought of the Western ranchman is to get Texas cows, which are the same as the Mexican cows, except as improved by better handling, for the foundation of his herd.

If prices are too high in Texas he comes through to Mexico.

Experience has shown that with one or two crosses these cows produce much finer and more profitable beef cattle than do the average cows in the United States. They are not so domesticated or effeminated, and hence are better adapted to the rough ways of ranch life. It is not at all likely that they would be of service in improving our breed of milch cows.

Beef cattle.—When prices make it profitable large quantities of young cattle are exported to the United States to be driven to the ranges to grow and fatten for our markets. These cattle are simply frames, and, fattened on the juicy grasses of our West, make good beef at four and five years of age.

Duties.—All cows, heifers, and bulls entered for breeding purposes are free of duty in the United States. Beef and other cattle pay 20 per cent. on the original cost price.

Values.—The prices of all kinds of live animals as cattle, horses, mules, sheep, goats, have greatly increased within a few years. Herds of cattle, which five years ago were slow sale at $4 ahead as they ran, now bring $10 to $15. Ranchmen hold cattle so high that buyers have fallen off greatly and the movement is slight at present.

Export duty.—The demand in the United States sent a good many buyers to this State last year. The export of cattle so alarmed the State authorities that they passed a law levying an export tax, amounting to $2.50 per head on cows and $1.25 on other cattle.

This tax applied if cattle were moved from one Mexican State to another. Large transactions were broken off and sales for a time almost entirely suspended. By a late law this tax has been reduced to $1 per head on cows and 47½ cents on other cattle.

Markets.—The principal market and that which takes perhaps two-thirds of the surplus is the interior of Mexico. After supplying the small local demands about one-third goes to the United States through Texas, New Mexico, and Arizona. Some have been shipped by vessels

to Havana, and in the future this may be an important market for these cattle.

Driving.—They are driven in herds by horsemen, getting food and water *en route*. Those for the interior are fattened outside and marketed in the city of Mexico, San Luis Potosi, Guanajuato, &c.

Those for the United States are used for breeding or fattened and shipped East by rail. The opening of railways in Mexico will cause some shipments to be made by rail.

Costs, &c., of driving.—The cost and risk of driving vary greatly with the route, season of the year, grass, handling, and condition of the stock. From the interior of this State to this frontier the country is comparatively open, very level, and in good seasons has plenty of water and grass. My averages show the losses on this route not to exceed 4 per cent.

In the upper country, where grass and water are scarcer and the road much rougher, the losses have reached 25 per cent. on the route from the place of purchase to the border. The cost per head from San Fernando to this city, not including export dues, has amounted to $1 per head. This included going, buying, and returning pay of drivers, losses *en route*, &c.

The best routes are more or less direct lines to the nearest American town.

EXPORTS TO UNITED STATES.

The total of live animals exported from Mexico to the United States for the year ending June 30, 1881, was $314,272, and for the following year, $455,917, values in United States coin, nearly all of which passed over this border. Of these amounts probably more than one-half were cattle.

IMPORTS OF AMERICAN CATTLE PRODUCTS.

In the year ending June 30, 1882, Mexico imported from the United States (values in United States coin):

Description.	Quantity.	Value.
Horned cattle.... head..	798	$18,602
Leather ..... pounds..	2,552	861
Manufactures of leather:		
Boots and shoes ..... pairs..	60,610	85,827
Saddlery and harness.....	.....	34,497
All other manufactures of	.....	29,344
Beef:		
Fresh.....	None.	.....
Salted, or cured..... pounds..	13,026	1,501
Butter..... do....	104,597	26,105
Cheese ..... do....	44,406	6,895
Condensed milk	.....	1,362
Tallow ..... pounds..	543,909	43,768
Total	.....	248,252

MEXICAN DUTIES.

The following are the import duties on American cattle and cattle products:

Articles.	Principal duty.	Weight duty on 100 kilograms (220 pounds), gross.
Horned cattle	Free.	
Leather, net weight ..... kilograms*	$1 43	$1 00
Leather, manufactures of, not specified, gross weight ..... kilograms	86	75
Boots or half boots:		
Cow-hide of more than 18 centimeters (7.09 inches) of sole ..per dozen	16 50	1 00
Of calf-skin, or patent leather of same dimensions ..... do	27 00	1 00
Shoes:		
Leather, all classes, for men, same dimensions ..... per dozen	7 00	1 00
Leather, low, for children, not exceeding 18 centimeters ..... do	5 00	75
Saddles, all classes	(†)	50
Harness for carriages:		
Common, gross weight ..... kilograms	86	75
Fine, gross weight ..... do	2 60	75
Meats:		
Preserved, of all classes, in juice or dry (not including extract of meat), net weight, including in this the weight of the inner wrapper, kilograms	72	50
Smoked or salted, net weight ..... kilograms	24	50
Butter, net weight, including in this that of the inner wrapper ..... do	24	50
Cheese, all kinds, net weight, including in this that of the inner wrapper, kilograms	14	50
Condensed milk	(†)	75
Tallow, all classes, net weight ..... kilograms	06	50

* Kilogram=2¼ pounds. † Fifty-five per cent.

In addition to above duties, add 2 per cent.

The butter was probably entirely oleomargarine, and generally a most disreputable article. In the United States I use butter very freely, but here, even the finest quality of so-called butter which I can import, especially from New Orleans, is so poor that I hardly taste it once a month. A small amount is used in cooking. It is not likely that butter would keep good long enough to make the journey unless packed in ice

CATTLE CENSUS OF NORTHERN MEXICO.

The total of cattle can only be estimated. Statistics cannot be obtained except in some cases, and they are chiefly remarkable for their unreliability. In a former report I estimated the number of cattle in Northern Mexico at 1,500,000. In this State, I am informed that the list handed in to the State treasurer gave the total at about 180,000, but a counting up by sections and "rancheros" gives nearly or quite 750,000. Consul Campbell forwards a similar list from Nuevo Leon giving the total at 127,738. That list is probably more nearly correct, as the State is smaller, and cattle-raising is not the chief industry. Perhaps 250,000 would be a fair estimate of the number in that State.

The following is a rough apportionment:

Tamaulipas	750,000
Nuevo Leon	250,000
Coahuila	225,000
Chihuahua	225,000
Sonora, part	50,000
Total	1,500,000

Of this total hardly more than 1 per cent. are ever milked. This total has been considerably reduced within the past three years. The inte-

rior demand grows each year, and has greatly increased since railway building began. The higher prices in the United States have increased the export that way. Then the local demand has been doubled by the coming of so many Americans to the border towns. These demands which have raised prices so greatly have made the "rancheros" more careful to increase their stock, and will in time cause some improvements in methods of handling.

DISEASES.

There are various local diseases which occasionally attack these cattle, but I have not succeeded in getting any reliable information. While the reports promised me on these diseases are not to hand yet I have been unable to hear of anything like pleuro-pneumonia. The diseases which I have heard of are local, and, being caused by lack of water or grass, or from heat, are not infectious except for the time and place. I have not learned of any losses which would exceed twenty per annum in one thousand, except such as were obviously caused by bad weather or lack of water or grass.

CATTLE WEIGHTS AND MEASURES.

The following weights and measures are from actual experiments, and while of course other animals would vary, these were fair average animals of each class, five or six years old, and may be considered a fair average. The weights and measures are American:

Animal.	Height over fore-shoulder.	Length from between horns to root of tail.	Girth behind fore-legs.	Live weight.	Weight of dressed meat.	Value per pound.	Weight of fore-quarter.	Weight of hind-quarter.	Tallow.	Weight of hide.	Waste.	Value of hide per pound.
	Ins.	*Ins.*	*Ins.*	*Lbs.*	*Lbs.*	*Cts.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Cts.*
Bull	54½	89	78½	650	500	5	150	100	10	100	40	3½
Ox	56	92	78	650	470	5	140	95	30	100	50	5
Cow	53	87½	71	450	300	5	85	65	40	55	55	7

SOIL OF NORTHERN MEXICO.

The mountain ranges in Northern Mexico are of the same formation as the Rocky Mountains in the United States, of which they are simply the southern continuation.

The soil is strongly impregnated with limestone deposits; near the coast are found large saline deposits. The "*vegas*" or low bottom lands are alluvial deposits. Some, particularly near the Rio Grande and Gulf of Mexico, are black, waxy, and very fertile. Others in the higher plateaus are sandy or gravelly. The ranges, or grass lands, are thinly covered with soil, with, in many sections, large quantities of stones.

The coast portion of this State, Tamaulipas, extends back, say, 50 miles and is particularly good for cattle. The first plateau is considered good pasture for horses. Farther back the country is divided into valleys by hills and mountain ranges. The nopal and other varieties of the cactus family are found all over Northern Mexico. There are large sections where stones, cactus and thorny shrubs cover the thin soil, so that

it will support nothing but goats. Much of this barrenness is caused by lack of regular rainfall.

CLIMATE.

The average temperature of the coast lands of Tamaulipas is about 77° Fahrenheit. The coldest weather is usually in January. Near Matamoras frosts occur every winter, and occasionally a little snow falls. Farther down the coast the winters are much milder. The greatest heat is usually in June, when 100° Fahrenheit in the shade is occasionally reached. The temperature ranges in the nineties for some four months, May, June, July, and August.

The difference between maximum and minimum daily heat is about 10° to 15°. The northers, a strong wind from the north, with or without rain, blow at intervals in the colder months. These begin light and warm in September and come, say, two per month until April. The most severe ones are usually in December or January. Their duration is from three to ten days. In the intervals the weather is comparatively cool, say 70° to 80° in the middle of the day. For ten months the wind is from the south. Without this wind the climate would be almost unendurable. The annual rainfall is about 33.65 inches, nearly one-half of which often comes in the autumn. Up river the extremes of heat are much greater, the temperature sometimes reaching 117° Fahrenheit in the shade. The absence of the trade wind with the great heat makes the climate very trying. In the winter the northers blow with great force, and the temperature goes lower than near the coast. On the higher plateaus the climate is more equable. Some portions, like Saltillo, have a magnificent climate.

ELEVATIONS.

The coast portion of Tamaulipas is from 100 to 200 feet above the sea level.

This city, Matamoras, is 165 feet; Nuevo Laredo, 806 feet; Piedras Negras, 1,461 feet; mouth of Pecos, 2,027 feet; near Presidio del Norte, 2,779 feet; near Paso del Norte, 3,684 feet. These elevations are those given in Major Emory's boundary survey. The Mexican Central Railway gives the height of Paso del Norte at 3,756 feet; Chihuahua City 4,672 feet; Lerdo, 3,764 feet. The late Consul Wadsworth gives the height of Saltillo in Coahuila at 5,217 feet.

CATTLE IN COAHUILA.

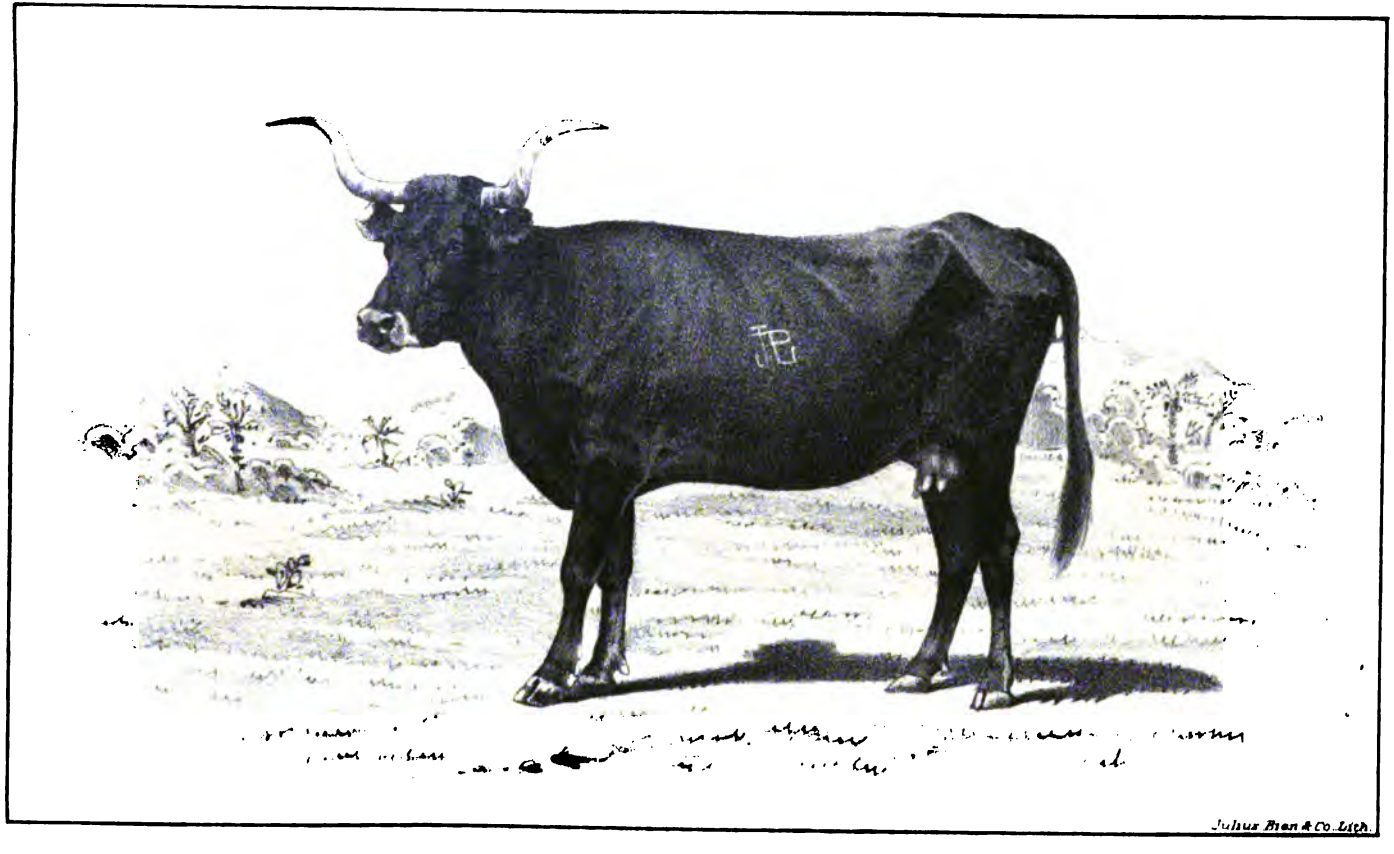
The sudden death of Consul Wadsworth of Saltillo, which occurred on the 8th instant, has been a serious loss in the preparation of this report. At the time of his death he was preparing a report not only upon the points suggested in the circular but upon others which I had asked of him. He was to have had photographs of cattle taken in Saltillo to show more plainly the difference between the same animals on the coast and on the plateaus. His zeal and ability were such as to warrant me in expecting a very valuable report.

CONSUL SCOTT'S REPORT.

The report from Consul Scott, of Chihuahua, herewith transmitted, is of special interest, because from his long residence there and ownership of such cattle he is particularly well informed.

Julius Bien & Co. Lith.

MEXICAN OXEN



MEXICAN COW

OTHER REPORTS.

I beg to call particular attention to the reports transmitted from Consul Campbell, of Monterey, and Vice-Consul Pridgen, of Piedras Negras, and Consul Smith, of Nuevo Laredo.

ILLUSTRATIONS.

I give herewith four views of cattle. The first is the average typical cow. She was about seven years old, of dark brown and black colors. She had been milked about three months. Although comparatively tame it was with difficulty that she stood lassoed long enough to get the view. The second view is the yoke of oxen; both dark red in color. The "off ox" was castrated at two years, and was about eight years old. The "near ox" was castrated at about four years, and was decidedly staggy. The horns of the latter had been sawed off. The yoke and goad are shown in the illustration. The third view is of a "paint" bull, red with large white spots. He was about six years old, and though wild stood fairly still when driven into a corner of the "corral" and guarded by four or five men.

These views were taken at the "Matanza" (slaughtering place) of Mr. Enrique La Pierre, a resident of this city, who owns a "ranche" some 14 leagues from the border. They were all carefully selected by him so as to be fair average animals of their respective classes.

ACKNOWLEDGMENTS.

As Mr. La Pierre refused to accept any payment for his trouble, I desire to express here my obligations to him, not only as to the views given but as to much valuable information concerning cattle.

I also beg to express my indebtedness to Don Feliciano San Roman, of Brownsville, Tex., for information. Mr. San Roman has a large cattle "ranche" near Soto de la Marina in this State.

WARNER P. SUTTON,
Consul-General.

UNITED STATES CONSULATE-GENERAL,
Matamoros, December 31, 1883.

CATTLE-RAISING IN CHIHUAHUA.

REPORT BY CONSUL SCOTT.

With two or three exceptions the herds of cattle in this State are native Mexican, which are in most respects closely allied to the ordinary Texas cattle of a few years ago. They have been raised in much the same manner, running wild upon the plains, frequently wandering off from 50 to 75 miles from the hacienda whose brand they bear; which brand is supposed to be respected by neighboring haciendados, and I must say that property is generally secure from theft.

The laws regulating cattle-rearing are as good as can be found in any country, and any cattle stealing is punished with hard sentences.

There are no cattle in this State that would be worthy of importation to the United States for male-breeding. As a general rule the herds have been seriously injured by long inbreeding and a surplus of poor

bulls on the haciendos. The cows are much superior to the bulls, and those crossed with Shorthorns, Herefords, &c., make very desirable animals. The most marked improvement occurs in the first cross.

The nature of the climate (Chihuahua being within what is termed the "summer rain belt") demands a class of cattle that will travel a long ways to water, when necessary eat the grass as they can find it, as no other food is ever prepared for them. Such a thing as a hay-stack or straw-rick I have never seen in the State.

No shelter is ever prepared for them except to probably plant some cottonwood along the ditches and streams of the farms. In many instances nature provides this shade.

The climate is dry from October 15 until the following June, when the rainy season sets in. During July, August, and September the vegetation grows very rapidly, and the plains soon become covered with a rich growth of fine grass of the beech, buffalo, and gramas kinds.

The cows are fine breeders, but I consider this more on account of climate than of breed.

Chihuahua is a table-land sloping east from the foot-hills of the Sierra Madre Range (where the plains are about 6,500 feet above the sea) to plains and valleys divided by small ranges of mountains from 4,000 to 5,000 feet elevation.

These cattle, when driven to Colorado and Kansas, fatten on the nutritious grasses of those States very rapidly, and make good meat for market.

The cows kept for dairy purposes are few indeed. They are poor milkers, not averaging more than a half gallon a day, and are only milked once in twenty-four hours.

But little butter and cheese are made. Butter is worth 62½ cents per pound, and a very ordinary article of cheese 15 cents per pound. Butter pays a Federal duty of 24½ cents a kilogram and cheese 14½ cents a kilogram, and in addition to this they both pay a State and city duty.

The State of Chihuahua (86,000 square miles) contains about two hundred and fifty thousand head of cattle and not a fence, except around some planted grounds. About twice a year each hacienda gathers its cattle, which they term a "Rodeo." To these rodeos the neighboring farmers are invited, and when the cattle are all in a bunch each set of men select the stock of their respective farms and drive them home.

The climate is all that could be desired for a stock country. It seldom snows and is free from the cold north wind, termed "Northers" in Texas.

The percentage of calves is large and would be larger if they paid more attention to the bulls, and killed off the old ones, which are only in the way of service of their more vigorous juniors.

If some attention were given to proper food for the cattle during hard seasons; if hay were cut and stacked convenient to water, well-bred grass-raised bulls from Texas introduced, &c., there would be a marked difference in the cattle.

Sufficient crossing has been done to show the great benefits which will result from systematic cross-breeding.

The Polled Angus has not been tried in this State as yet. Their color is against them in a clear climate where the sun's rays are so hot.

There have been some small herds driven out of the State into New Mexico and Arizona, principally for breeding purposes, which I am told have done well. They go out via El Paso, Tex.

They handle the cattle roughly, even killing them at times in running them over the range. In this manner the cattle become wild and fail to make that flesh which they otherwise would.

LOUIS H. SCOTT.
Consul.

UNITED STATES CONSULATE,
Chihuahua, Mexico, November 1, 1883.

CATTLE IN THE STATE OF NUEVO LEON.

REPORT BY CONSUL CAMPBELL, OF MONTEREY.

DIFFICULTY OF OBTAINING STATISTICS.

I have the honor to transmit a report on cattle in the State of Nuevo Leon, Mexico, as per instructions from the Department of State July 18, 1883.

Owing to the great difficulty of procuring exact and reliable information as to facts relative to cattle in this State my report will be necessarily meager.

I have interviewed numbers of the most intelligent and reliable gentlemen of the city, many stockmen of different parts of the State, besides more than a dozen butchers of Monterey, from all of whom it has been impossible to elicit the desired information. Some of them had only a general vague idea, and most of them none at all. The butchers could not tell the average weight of any class of live-stock, nor the difference between the net weight and live weight.

After boiling down the many conflicting guesses, and mixing in my own observation, which of necessity has been limited, I have gathered together a few facts which I think can be relied on.

THE TOPOGRAPHY OF THE STATE OF NUEVO LEON.

There is comparatively a small portion of the State utilized for stock-ranges. The northern part is generally too dry and poorly watered by eams, besides being covered with the stubby and thorny chaparral which overshadows the grass to such an extent as to render it unfit for grazing cattle. The middle and western, and a large part of the south of the State are divided by mountain ranges into narrow valleys, which are used for the purpose of cultivation, leaving the eastern and south-eastern portions for raising cattle to any extent.

There are very few extensive ranches in the State, and even the lands in these divisions devoted to grazing purposes are generally overgrown by chaparral, rendering it extremely difficult for stockmen to corral their cattle in order to count and brand them.

THE CATTLE OF NUEVO LEON.

Breed.—The breed of cattle is almost entirely of the old Spanish or Mexican blood. They have large frames, are of various colors and are hardy, good rustlers.

Meat.—The net weight of beef slaughtered for market, I would judge, is about the same as cattle of the same grade and age in the western part of Texas, and the meat is tender, juicy, and of good flavor. The

stock-cattle in the eastern and southeastern part of the State keep in excellent condition the year round, and are generally of fine size.

Work-oxen.—The work-oxen are generally large and well-kept. The native grasses are nutritious and abundant, when not choked out by the chaparral.

NATIVE PREFERRED TO FOREIGN BREEDS.

The stockmen are paying no attention to the importation of foreign breeds, preferring the native stock, which they say are more hardy, better adapted to the climate, and hence better feeders, which is a very important consideration, owing to the difficulties before mentioned.

Cattle are only raised in this State for beef and work stock, and as they already possess the qualities adapted to these purposes they see no reason for a change or any improvement by crossing these with other breeds. The improvement of cows for milk and butter purposes is entirely overlooked and not thought of, although there is ample room for it.

MILK, BUTTER AND CHEESE.

Good milch cows are very rare; in fact you might say that there are none at all. Goat's milk is universally used for domestic purposes, and butter is as rare as manna. Nearly all the butter used is oleomargarine imported from the United States, of a very inferior quality, which retails at 60 cents a pound in Monterey. Of course such being the facts there is no cheese manufactured from cow's milk in this State. A little of an inferior grade is made from goat's milk. All the cheese consumed here is manufactured near Monclova, in the State of Coahuila, and that is not of the best quality. It is retailed here at about 30 cents a pound. I am satisfied that if the stock was crossed by the Jersey, Ayrshire, or some other good milk and butter yielding breed, a very fine milch cow would be the result. But as there is very little demand here for cow's milk or butter, outside of a few hotels, I am afraid it will be a long time before any one will have the enterprise to attempt the experiment.

CATTLE EXPORTS TO THE UNITED STATES.

At least one-third of the cattle of this State have been shipped to Texas or to other States in the last two years, which of course has enhanced their value very much. Two years ago cattle could be bought in this State for an average of $5 a head; now they command from $12 to $14 a head, which has put a stop to large purchases for shipment. It will not compensate any one to buy cattle at the present prices too far from railroad facilities and attempt to drive them through the country any considerable distance. The difficulties are numerous and expensive. It would be cheaper to buy them as near as possible to the point where the prospective ranch is located, even at apparently exorbitant prices. I know of one party who purchased 1,500 head of cattle last spring near Lenares, in this State, and attempted to drive them through the country to a point near Piedras Negras, who lost 500 of them before he reached his destination. Another party started from near the same place to the same destination a month later with 3,500 head and lost 20 per cent. of them, although he shipped the most of them by rail the greater part of the way. These losses were caused by the unreliability of Mexican herders, by which was caused stampedes

en route, when the cattle would scatter through the mountains, chaparral, and mesquite, getting beyond the control and recovery of the herders; others, for want of sufficient pasturage along the narrow valleys, would give out and have to be left. So by the time they reached their respective localities their cattle had cost them 25 per cent. more than original cost and a world of trouble and vexation.

The cheapest and best mode of exportation of cattle from the eastern or southern parts of this State is to drive them through to this place (Monterey), and ship from here via the Mexican National Railroad, on account of the difficulties and uncertainties and expenses before stated. They can reach Laredo, Tex., from Monterey in eighteen hours.

Cattle census of Nuevo Leon, 1883.

Municipalities.	Number of head.	Value.	Municipalities.	Number of head.	Value.
Abasolo	250	$2,500	Lampazos de Naranjo	5,600	$56,000
Agualeguas	650	6,500	Linares	3,000	30,000
Allende	550	5,500	Los Aldemas	2,500	25,000
Apodaca	560	5,600	Los Herreras and Marin	3,800	38,000
Aramberri	650	6,500	Meir y Noriega	450	4,500
Bustamante	300	3,000	Mina	5,000	50,000
Cadereita Jimenez	12,700	127,000	Montemorelos	3,000	30,000
Carmen and Ceralvo	1,500	15,000	Monterey	1,690	18,035
Cienega de Flores	500	5,000	Paras	1,650	16,500
China and Dr. Arroyo	8,200	82,000	Pesqueria Chica	1,250	12,500
Dr. Coss and Escobedo	970	9,700	Rayones and Sabinas Hidalgo	12,450	124,500
Galeana and Garcia	9,000	90,000	Salinas Victoria	2,000	20,000
General Bravo	6,400	64,000	Santa Catalina	400	4,000
General Teran	20,200	202,000	San Nicolas de los Garzas	238	2,380
General Trevino	3,200	32,000	San Nicolas Hidalgo	12,000	120,000
General Zuazua	480	4,800	Santiago	1,900	19,000
Guadalupe	450	4,500	Vallecillo	600	6,000
Higueras	150	1,500	Villaldama	1,000	10,000
Hualahuises	350	3,500	Zaragoza	200	2,000
Iturbide	450	4,500			
Jaures	1,500	15,000	Total	127,738	1,278,515

AN ENERGETIC DAIRYMAN WANTED.

In conclusion I would state that, if some enterprising dairyman would start the ball by bringing to market pure, rich milk and fresh, palatable butter, it would create a taste among the people for these luxuries and a crying demand before much time for goodly quantities of both.

ROBERT C. CAMPBELL,
Consul.

UNITED STATES CONSULATE,
Monterey, Mexico, November 15, 1883.

STOCK-RAISING IN THE STATE OF NUEVO LEON, MEXICO.

SUPPLEMENTARY REPORT BY CONSUL CAMPBELL, OF MONTEREY.

I have the honor to submit a supplement to my report on cattle in the State of Nuevo Leon.

In regard to cattle I have nothing more of interest to add to my former report on this subject.

This State is generally better adapted to raising sheep, goats, hogs, horses, mules, and asses.

SHEEP-FARMING.

According to the latest attainable statistics, the number of sheep in this State approximate 206,913, the average value of which is $1 apiece. The breed is almost entirely the common Mexican or Spanish stock. They attain a medium size at maturity, and are generally hardy. They yield about 2½ pounds of wool each to the clip, twice a year, which brings in this market from 12 to 14 cents a pound. Nearly all the wool produced in this State is marketed at Monterey, very little being exported. It is shipped to various factories in Mexico, to be manufactured into articles of wear. The grade of wool is generally coarse, but sheep-raisers are beginning to open their eyes somewhat to the advantages of improving their breed, both for an increased yield of wool and a better grade. But these people advance very slowly and cautiously towards any innovation upon the old and well-known way. A few Texas merino bucks have been imported, but the advantages of the cross is not yet sufficiently apparent to induce many to attempt the experiment at the cost of $25 apiece for bucks.

The flocks being generally well guarded by shepherds and trained dogs are seldom invaded to any extent other dogs or wild animals.

They are to some degree afflicted with scab, but not sufficiently to claim serious attention.

There are few very large flocks in the State, ranging from three thousand to four thousand, but the largest flock numbers forty thousand. The greatest drawback to sheep-raising is occasional droughts, during which sometimes from 5 to 10 per cent. perish for lack of water. Fresh mutton retails at 8 cents a pound.

GOAT-RAISING.

Goats are about as remunerative as sheep, as they are more hardy, not subject to as many diseases, and can get about better over the mountains and among the thorny bushes with which the ranges are thickly covered.

Near towns and cities large herds are exclusively devoted to the production of milk, as goat's milk is almost exclusively used for domestic purposes and for the manufacture of cheese. The average yield of milk per nanny is 1 quart, which sells at 12 to 14 cents per quart.

Most of the male animals are slaughtered for the market when kids from three to four months old, and are worth 75 cents each. They are of the common country breed, and the improvement of the blood is never dreamed of, though I am satisfied that the Angora would pay most handsomely, even by exporting the Mohair.

HOG-RAISING.

Hogs are not raised to any great extent, as will be seen from the subjoined tabular statement. They, however, pay a good profit. The hogs here are a cross between the Spanish porker and the wild hog of the mountains. They are very hardy, being rarely attacked by cholera or similar diseases.

The average weight of those killed for market is 175 pounds. They are fattened and slaughtered chiefly for the lard, which brings 20 cents a pound. Fresh pork is worth 12½ cents a pound. None is ever cured for bacon. All the bacon used is principally by Americans, and is imported from the United States, and sells at 40 cents a pound; sugar-cured hams are worth from 60 to 75 cents a pound.

About five hogs are slaughtered a day to supply the pork demand of Monterey of 50,000 people. The people are fond of it, but the majority are compelled to eat cheaper meat—beef, kid, and mutton. The greater part of the lard consumed is brought from surrounding haciendas. No disposition is manifested to improve their stock of hogs by foreign importations, such as the Chester, Berkshire, and the like.

HORSE-RAISING.

Horses are raised to a considerable extent when the population is considered. The average price of horses raised in this State is $13.50 each. They are principally of the Brancho breed, of medium size, well shaped, and very durable and hardy.

He is much better suited for the general purposes for which he is needed and used here than the larger American horse. He can travel farther in a day on less water and food than the American horse.

There are, however, a good many large-sized horses raised in the State from imported stallions, and the number will be increased as heavy American plows and general agriculture demand them.

A great many horses, especially mares, have been bought and shipped to the United States this year. I think 25 per cent. of the horses in the State have been purchased and shipped beyond the Rio Grande in the last twelve months.

MULE-RAISING.

All the mules used in the State are raised here. They will average 14 hands high, are generally well proportioned and very hardy. There are some larger mules raised, but very few over 15 hands high. Many have been bought by the Americans and carried into Texas this year. They are used entirely for wagon and carriage purposes here, having never been able to displace the ox from the plow.

THE BURRO.

The burro, or, as he is called in the United States, the ass, though a modest and small animal, occupies a very important place in the industries of Mexico, as is generally the case in all mountainous countries. He is indispensable and can never be superseded by the horse, mule, or locomotive.

Perhaps when aerial navigation is perfected his dominions will be somewhat encroached upon, but even then he will hold an important place in the industries of Mexico. Kind by nature, patient to a fault, economical in his diet, he will eat his allotted rations of cactus at home, and enjoy a modicum of old rags, paper, &c., when he comes to town without complaint. Burdened with loads larger than himself, he submits to the cruel whacks of his master's "baston" without murmur.

He is faithful and true. He bears his rider with unerring step along precipitous mountain ledges, and packs ponderous burdens of gold and silver ore from otherwise inaccessible mountain heights to the valleys below. Fruits and agricultural products are brought by him from "quintas" among rugged hills to the hungry of the cities, and with equal good grace he tugs with his heavy loads of fire-wood from forests high up the mountain sides to warm the shivering denizens of the city and hamlet.

With all his valuable qualities and great utility he is worth only $5 in the market.

Large droves of the ass are used to transport merchandise from city to village, and from hacienda to town over roads too rugged for wagons.

ROBT. C. CAMPBELL,
Consul.

UNITED STATES CONSULATE,
Monterey, December 3, 1883.

CATTLE-RAISING IN THE STATE OF TAMAULIPAS.

REPORT BY CONSUL SMITH, OF NUEVO LAREDO.

In response to the cattle circular of July 18, 1883, I have the honor to submit the following:

For the purposes of this report inquiries have been made on a territory 150 miles long and 75 miles wide.

THE TAMAULIPAS CATTLE-RANGE.

The features of this territory have often been described, but it may not be amiss to state that the greater part of it is a plain, not strictly prairie, but resembling very decidedly rolling prairie, broken by some ranges of low hills.

Covering this whole territory there is an abundant growth of a short nutritious grass, upon which cattle thrive very finely.

Cattle require neither feeding nor shelter, or what would perhaps describe the ordinary practice more correctly, they receive no care except such as relates to herding.

The soil is for the most part a sandy loam with a substratum of sandstone. Gravel is found on the hills. Clay is found in beds of no large extent. Chalky limestone, which makes excellent lime, is found in some localities.

Water is very scarce and is often found at long distances only, 10 to 12 miles. This is a great drawback to cattle-raisers, it being so that cattle must of necessity be driven several miles to water. A drought means loss and damage to cattle-owners. The drought of the present year, which was exceptionally severe, was absolutely disastrous to many men and seriously decreased the number of animals.

THE EFFECTS OF DROUGHT IN CATTLE-RAISING.

It is estimated that there are now about 40,000 head of cattle on this range. The larger part of these are held by men who have large ranches and own the water they need. Small cattle-owners are largely damaged in time of drought for the scarcity of water, and because the scorched grass is innutritious.

There are not many cattle near the Rio Grande, because of the facility of escape by cattle-thieves across the river.

The old Spanish breed of cattle is the only one found here. It is asserted by stockmen that the heavier breeds of cattle cannot be made profitable, owing to the fact that they cannot endure the long trips to and from water. They say it does not seriously hurt these light-bodied animals to go 10 miles a day for water, but that heavy-bodied animals

would surely break down. Whether or not the supposition is correct, and so far as I can learn it is only supposition, it serves as an effectual objection to the introduction of other breeds. I have no information that any attempt has been made to introduce any other. I can conceive that when some man demonstrates the feasibility of making wells so as to insure a good water supply, the whole question will be changed.

MILK, BUTTER, AND CHEESE.

Milk is only an incident. A man is content if he can get milk enough for his family from ten to twenty cows. A cow is popularly supposed to yield a gallon of milk a day, but half that quantity would be nearer the truth here.

Butter is not made to any extent. The milk, as I have observed it, is very thin and poor. Then the excessive heat renders butter-making difficult.

A little cheese is made, put up in little cakes weighing about a pound. They look as digestible as marble, yet people eat them and live.

THE GRASSES OF TAMAULIPAS.

There are no cultivated grasses. The short grass found on the plains grows under apparently unfavorable conditions, and while there is practically a limited range, there is no motive to cultivate grasses. I do not think that any one of the ordinary grasses cultivated elsewhere would succeed here. I think the excessive droughts which prevail would make their successful cultivation impossible.

CATTLE EXPORTS.

Comparatively few cattle are kept on the ranches to maturity. The sales are mostly of two and three year olds. The price is agreed on between seller and buyer with reference to an average as they stand, the buyer stipulating that they shall be in good flesh.

Only a very small number of fattened animals are driven. For the most part the beeves exported come from small owners near the point of export.

The larger part, almost all the cattle exported, are taken to points in Texas and farther north for fattening. The cattle on the range are neither sheltered nor fed, and are, therefore, in better traveling condition than very fat animals.

No considerable number of cattle have been exported for breeding purposes.

MISCELLANEOUS STATISTICS.

When, as in this year, there have been heavy losses of cattle, and herds must have the number of breeding animals increased, these are drawn from the State of Chihuahua by ranchmen living near the Sierras. No breeding cattle have been imported from the States at this point during the year.

A majority of the work animals are bulls. Some oxen are seen, but comparatively few.

These observations have been very general from the fact that exact data were impossible. The estimate of numbers of animals is the best obtainable.

This immense territory ought to sustain hundreds of thousands of cattle. The land is cheap, and it is plain that intelligent enterprising men would find this a most inviting field.

STEPHEN H. SMITH,
Consul.

UNITED STATES CONSULATE,
Nuevo Laredo, December 2, 1883.

THE BREEDING CATTLE OF NORTHERN MEXICO.

REPORT BY VICE-CONSUL PRIDGEN, OF PIEDRAS NEGRAS.

I have the honor to submit to the Department of State the following report in relation to "breeding animals" of my consular district:

This subject comprises one of the main industries and chief export commodities of Northern Mexico. The fact that Mexican cows and mares are much sought by ranchmen of the United States for breeding purposes, naturally engenders the inquiry as to the reason. It is not because they are larger and finer than American stock, for such is not the case. While the cattle possess large bone and frame, still they are wonderfully deficient in flesh, and having long legs, exhibit entirely too much light underneath them, thus evidencing a great need of flesh and muscular development. Such is no doubt attributable to the fact that they have been too much inbred. It cannot be the fault of the country, for no region under the sun is better adapted to growing stock than Northern Mexico. Climate, grass, water, and the general topography of the country are decidedly favorable to animal comfort and development. True, there are many localities where all kinds of stock are penned during the night, and held under restraint by herders during the daytime to prevent them from trespassing on unprotected farms, and no animal of the cow or horse kind can fully develop under such treatment. They need to range nomadically in order to have anything like a fair chance for size. Be the causes what they may, it is a generally recognized fact that the Mexican stock is inferior to and much smaller than American raised animals. But the Mexican cattle being "acclimated" and healthy, constitute an excellent medium upon which to cross the unacclimated Durhams and other fine bloods. Such cross produces a large, healthy, compact animal that is highly estimated by Southern and Western stock-raisers of the United States. The first cross is estimated at 50 per cent. in value above the ungraded; and thousands of beeves of this class (half breeds) are being transported from the prairies of Texas, New Mexico, Kansas, Nebraska, and Colorado to Chicago and Saint Louis, and sold in competition with stall-fed cattle of the Northern and Middle States.

It is the prevailing opinion among stock-growers who are familiar with the various grades of cattle, that a cross between the American "fine bloods" and the acclimated cows of Mexico, imparts to the offspring a quality of health, vigor, size, development of flesh and compactness of form, not common with other grades.

In the interior of Northern Mexico can be purchased many thousand long-horned cattle for breeding purposes, and at reasonable prices.

B. J. PRIDGEN,
Vice-Consul.

UNITED STATES CONSULATE,
Piedras Negras, December 10, 1883.

CATTLE-RAISING IN SONORA

REPORT BY CONSUL WILLARD, OF GUAYMAS.

BREED.

In reply to circular and cattle memoranda, of July 18 last, received at this office, I have the honor to report that the cattle of this district are the long-horned Spanish breed, of medium size, principally raised on wild pasture, and mainly used for labor and as meat. No butter or cheese, save what is used for home consumption, being produced, and that only in the northern section of the district.

PRICES.

The purchasing price of cattle is as follows: Stock-cattle, from one to two years old, $8 to $10 per head; three to four years and over, $12 to $18 per head; cows with calves, $16 to $30 each.

LACK OF STATISTICS.

No cuts or forms of animals are obtainable here, from the fact that in none of the sections of this district is any record kept of the number of cattle raised, its increase or decrease, nor the causes thereof, what is butchered or exported, nor of dairy products. It is impossible to furnish any statistics on these points.

EXPORTS TO THE UNITED STATES.

Up to one year ago but few cattle were exported to the United States from this district. The number of cattle exported to Arizona and New Mexico from this district for the quarter ending September 30 last, was 5,284, which includes one, two, and four year olds and upward, the most of which are claimed by the purchaser to be for breeding purposes.

IMPORTS FROM THE UNITED STATES.

As regards the means of increasing the exports of meats and dairy products to this district from the United States, at present, there are none.

SONORA AS A CATTLE-RANGE.

There is no reason why Sonora should not be a large and profitable field for stock-raising, as the greater portion of the lands are more fit for grazing purposes than for culture.

A. WILLARD,
Consul.

CONSULATE OF THE UNITED STATES,
Guaymas, October 5, 1883.

CATTLE IN LOWER CALIFORNIA.

REPORT BY CONSUL VIOSCA, OF LA PAZ.

The rancheros or cattle-breeders of the peninsula are still ignorant of the far superior breeds existing in other countries. The cattle introduced into the territory by the first Spanish settlers have continued to be the propagating breed, and not until a few years ago did the farmers of La Paz and around San José and Cape San Lucas, who are in frequent business communication with the people of Upper California, learn the existence elsewhere of other kinds of stock of greater superiority than their long run out breed of Spanish cattle. Hence the introduction of American breeding stock from California has practically evinced that the offspring resulting from the native or Spanish and American cattle are already giving much better results, and this has created considerable sensation among farmers and cattle-breeders here.

It would be very difficult to ascertain the total number of cattle in the district, and more so the percentage of the two existing breeds. The stock now in the country is not only sufficient for home demands, but also to partly supply the Gulf border States with dried beef and tallow, besides shipping yearly an approximate amount of 12,000 hides to the United States and Europe, notwithstanding the mortality of cattle caused by the scarcity of rains during the previous years.

To make a report of anything near the requirement of the memoranda is beyond possibility.

JAS. VIOSCA,
Consul.

UNITED STATES CONSULATE,
La Paz, December 6, 1883.

HONDURAS.

CATTLE IN HONDURAS.

REPORT BY CONSUL HERRING OF TEGUCIGALPA.

PASTURE LANDS OF HONDURAS.

Large herds of cattle are owned in the departments of Ste. Barbara, Comayagua, and Tegucigalpa, but the largest are held in the departments of Olancho, Gracias, Yoro, and Colon.

Much of the country of Ste. Barbara presents a surface very uneven, but the whole of it is covered, even the steep rounded hills from top to bottom, with a living verdure, kept fresh and perennial by the mists which hang about the summits, or condense into showers. In the valleys nearly every square league is abundantly watered by pure limpid streams, swift and cool and healthy for cattle. Pine trees scattered over the mountain sides afford all the shade that is needed, and along the water-courses, palms, plantains, bananas, mangoes, and wild figs, with many other plants and trees, grow most luxuriantly. Cattle eat eagerly and fatten quickly on the leaves and tender twigs of the wild fig.

In the departments of Tegucigalpa and Comayagua are a few valleys of large size, one at the city of Comayagua, which has been cultivated for centuries, and was at one time a well irrigated and productive region, where sugar-cane, cotton, maize, rice, and fruits were grown in abundance, but the irrigating ditches have been neglected and the fields have become wastes, whereon the thorny cactus blossoms undisturbed. In the dry seasons the plain of Comayagua resembles certain parts of the Indian Territory, or of Colorado. The soil is composed of washings from the volcanic hills surrounding this great valley, and of ashes from the volcanoes. It is doubtless rich in the mineral elements required for the growth of vegetation, and needs nothing more than water and cultivation to make it produce an abundance of food for man. Now, the grass is scant, dead and brown, yet the live stock crop it freely, and seem to find in it ample nourishment to sustain life without loss of flesh.

The departments of Tegucigalpa, Choluteca, and La Paz are on the arid slope of the Pacific. Here but little rain falls, and the pasturage is, consequently, not so good as it is on the Atlantic Slope, where the winds, laden with moisture from the warm waters of the Caribbean Sea, are forced upward to a higher and cooler altitude and deposit their burden in frequent showers. On the Western Cordilleras the rains come from the winds that blow at certain seasons from the Pacific, and when these rains fall vegetation springs up in most luxuriant profusion over all these hills and in all these innumerable valleys, and every rod of pasture is clothed with grass, fresh and nutritious, upon which cattle quickly regain the flesh lost during the drought. When a long period passes without rain, as has occured in this region, stock suffer greatly, and sometimes have been known to starve.

The departments of Olancho, Yoro, and Gracias, surpass all others as grazing regions, as those who have seen them readily concede. These

broad savannahs, stretching for many miles almost unbroken, are covered by a most luxuriant carpet of grass, and are crossed by hundreds of small streams, rising in the gravelly hills of the gold-bearing district west of the plains. The prairies are constantly refreshed by showers, which, beginning in May, increase in frequency and duration, until in November and early December, when they become almost continuous rains, at times falling copiously every night, for two or three weeks, But fortunately the days are usually clear and pleasant even in these rainy seasons, and though the streams rise rapidly over night. they as rapidly fall during the day.

CATTLE BREEDING IN HONDURAS.

Under such favorable circumstances cattle have ranged for centuries on the plains and *mesas* of Honduras; yet, no attempt appears ever to have been made to improve them by the introduction of improved blood, by the selection of the best animals with which to add to size, strength, or quality, or by other means known to breeders in other lands. There is a want of proper management, and of attention to the easiest and most natural methods. Bulls are not castrated until they are three years old, and men who run cattle estates say that about one-fifth castrated at this age die from the effects of the operation. They believe that more would die if the operation was performed earlier, but they admit that they have never known of a trial of the plan of altering very young animals.

The custom of selecting for slaughter the strongest, smoothest, and best bulls in the herd has doubtless done much to check the natural tendency to the improvement of the breed, which, but for this custom, might have been of great value, under the very favorable conditions existing in the districts named, even without the use of any already improved stock. Calves suck their dams much longer than they are allowed to suck them in the United States. Frequently a cow may be seen standing quietly, while a young calf tugging at a teat on one side, is aided in emptying the udder by a yearling sucking away at a teat on the other side. The spectacle has been seen of a cow suckling a calf, while a heifer stood sucking the opposite teat, and at the same time gave suck to her own newly-born scarcely dried by the sun, it had seen for the first time only an hour or so before.

Notwithstanding these disadvantages the cattle here are profitable to their owners, are of excellent quality for beef, of large size and remarkable docility; and with the modern improved methods of treatment and breeding, they could, of course, be made far more valuable.

DESTRUCTION OF CATTLE BY WILD BEASTS.

There are few dangers threatening cattle in Honduras. Chief among those which do exist is that arising from the existence of the mountain lion, the black tiger, or puma, and the cougar. These animals continue to haunt the mountains and occasionally kill calves or yearlings. The tiger is capable of killing a grown bull. Fortunately the wild beasts are not so formidable as in the north, and consequently losses from their attacks are not very great. The killing of a cow or a yearling or two by wild beasts occasions considerable excitement in the neighborhood where it occurs, and usually results in a hunt which ends in the death of the cattle destroyer.

THE CATTLE SPIDER.

Another drawback to the cattle industry is found in the existence of a spider, which, it is said, rushes out of its burrow in the ground, when disturbed by the tread of stock, and bites the animal at the first tender place it reaches, which is just above the hoof; and this causes fever and inflammation. The fever results in a separation of the hoof from the skin, and the hoof falls off. An early application of aqua ammonia or strong tobacco juice will stop the inflammation and prevent the loss of the hoof.

STOCK RANGERS AND HERDERS.

By law all owners of cattle have the right to graze their stock upon the Government lands; but no one has the right to inclose such lands without first obtaining a concession from the Government of such right or privilege. However, there is little or no need for fencing, as no causes exist here that drive cattle from their accustomed range. No fierce storms sweep over these savannas to drive cattle before them for days without ceasing; no frost ruins the grass; no ice closes the streams; no snow covers the herbage, and shade is furnished by the scattered live oaks, the pines, and by the hills. Stock that has become wonted to any locality will find nothing to tempt or to drive it to stray. This is decidedly favorable to the owner, since he is saved the expense of fencing, and needs but few men to care for his herds. Indeed, it is stated by those who have given the subject much study, that 50 cents per head will pay all necessary expenses of keeping a herd of cattle in Honduras. The native or Indian is by instinct, training, and inclination a *vaquero*, or herdsman. He can readily drive herds through the forest paths among the hills, and as readily find any animals that stray from the herd. He is a keen hunter, and therefore useful in protecting the herd from attacks by wild animals. Such men can be hired for $100 to $150 per year. They are docile, faithful, and even affectionate to those who deal justly with them. They are easily fed, for plantains, bananas, yams, and other food, upon which they usually live, grow in every part of the country.

CATTLE TAXATION AND EXPORT DUTIES.

Ownership of stock is indicated by branding, as "out West" in the United States. The various brands are recorded in the districts where the herds are kept, and when there is a sale the brand is duly described in the bill of sale. A tax of $2 per head is levied by the Government on each sale of cattle, and a municipal tax of 50 cents per head upon slaughtering. A duty of $2 per head is imposed upon bulls and steers exported and of $16 upon each cow exported. As cows are worth only about $18 when exported, it will be seen that the export duty of $16 practically prohibits the exportation of cows from this Republic. Slaughtering heifers or cows capable of breeding is prohibited by law. So it is evident that the Government of Honduras by these wise regulations is fostering the interests of cattle-growers as well as of the country generally, for the restrictions upon the exportation and the slaughter of cows are causing a rapid increase of the cattle in the country.

CATTLE INCREASE IN HONDURAS.

From the most trustworthy information obtainable, the increase, the expense, and the income of herds of cattle in Honduras are fairly represented by the following table, furnished by Mr. E. W. Perry, an intel-

ligent expert in the cattle business, and it is based upon the supposition that the herd is, in the beginning, composed of 1,000 cows about to drop their first calves. The average annual increase that will reach maturity is assumed to be 80 per cent. of the number of bearing cows in the herd. Practical graziers here declare that an average yearly increase of more than 80 per cent. may be confidently expected, but as no carefully kept records showing that to be true are obtainable, it is deemed better to use the above as the basis of said table, which here follows:

Years.	Cows.	Heifers.	Bulls.	Value of bulls at 3 years.	Value of herds.	Expenses.	Net gain.
One year	1,000	400	400	$4,000	$12,000	$1,000	$3,000
Two years	1,000	400	400	4,000	16,000	1,400	2,600
Three years	1,400	560	560	5,600	26,800	1,800	2,800
Four years	1,800	720	720	8,640	35,760	2,360	6,280
Five years	2,360	944	944	11,328	46,280	3,080	8,248
Six years	3,080	1,232	1,232	18,480	66,080	4,024	14,456
Seven years	4,024	1,609	1,609	24,135	89,850	5,256	18,879
Eight years	5,256	2,102	2,102	42,040	122,960	6,865	35,175
Nine years	6,865	2,746	2,746	54,920	171,440	8,967	45,953
Ten years	8,967	3,586	3,586	89,670	270,620	11,713	77,957
Totals	8,967	14,299	14,299	262,813	270,620	46,465	216,348

It will be seen that at the end of ten years the herd will consist of—

1,000 scrub cows, which may be valued at $10 each	$10,000
1,360 grade cows, which may be valued at $12 each	16,320
2,896 grade cows, which may be valued at $15 each	43,440
3,711 grade cows, which may be valued at $20 each	74,220
5,492 yearlings, which may be valued at $10 each	54,920
7,172 high-grade calves, which may be valued at $10 each	71,720
Total	270,620

The valuation of the above has been estimated as follows: 1,000 cows of the original stock will be worth $10 each for beef at the end of their usefulness as breeders. The increase of the herd during the first three years will include 1,200 half-breed and 160 three-quarter blood heifers, valued at $12 each. The next three years there will be 1,200 half, 960 three-quarter, 256 seven-eighth, and 480 heifers of higher grade, all valued at $15 each. In the seventh and eighth years there would be produced heifers as follows: 800 half, 320 three-quarter breeds, and 2,591 heifers of higher breeding, all valued at $20 each.

The average value of the bulls produced in the above herd has been estimated at prices which would make the general average $18.38. The price of animals might, by the continued use of purely bred bulls, be made almost or quite equal to animals of pure blood, but in this estimate it has been assumed that they are worth no more than $25 each at the end of the first ten years, or rather when the last calves shown in the table shall be ready for market. The expense of the management of such a herd for ten years will not exceed 10 per cent. of the value of the bulls.

EXPORTS OF HONDURAS CATTLE.

The markets for the cattle of Honduras are found in the towns scattered throughout the Republic and in the adjoining Republics. The available statistics, showing the amounts received for export duties on

cattle during the fiscal year ended with July of each of the following years mentioned below, were as follows:

Exported from—	1883.		1884.		1885.	
	Value.	Numbers.	Value.	Numbers.	Value.	Numbers.
Truxillo	$30,301	15,150	$44,886	22,443	$5,920	2,960
Puerto Cortes	3,111	1,555	5,477	2,738	4,057	2,028
Amapala	.....	.....	2,060	1,030	892	446
Frontiers	59,433	29,716	17,552	8,776	26,607	13,303
Totals	92,845	49,421	69,975	34,987	37,476	18,737

There appears to have been a material shrinkage, year by year, in the amount of duties from exports of cattle, while at the same time the sum received at Truxillo, in the year ended with July, 1884, showed a marked increase. That increase was due to the opening of a trade in beeves between the port named and the West India Islands. That trade was favored by concessions from the Honduras Government, but even the advantage thus afforded failed to make the traffic profitable, and it was abandoned after a trial of some two years. The losses which resulted were heavy. The steamer Marco Aurelio, fitted for and used in the exportation of cattle from Honduras to Cuba, has for some time been offered for sale in New Orleans. This seems to indicate that her owners see no hope of a profitable revival of that branch of the cattle business. During the year 1884–'85 exports of cattle from Truxillo fell from 22,443 to 2,960. The last-mentioned number were probably sent to British Honduras, which gets from this Republic all the beef required for consumption in Belize.

Puerto Cortes exports nearly as many cattle as Truxillo. In the year ended with July, 1883, exports from Puerto Cortes numbered 1,555. During the following year the number increased to 2,738, or 76 per cent. In the year ended July 30, 1885, the exports fell off 710 animals, or 35 per cent. At Amapala, on the Pacific coast, 1,030 were exported in 1883–'84, and only 446 were shipped thence in 1884–'85.

The most noteworthy changes in the value of exports of cattle from this Republic are those shown by reports from the frontiers. When the Cuban trade sprang up it drew to Truxillo many cattle, which would, but for the new demand, have gone across the border to Guatemala, to Salvador, and to other adjoining Republics. The result was that receipts of export duties from the frontiers decreased some 70½ per cent. in the year 1883–'84, when the Cuban trade was in its most active stage. When the Cuban trade died exports by way of the frontiers increased 45 per cent. These facts seem to indicate that the opening of the trade with the Antilles diverted 45 per cent. of the surplus beeves from their usual markets in adjoining countries, and also drew from the Honduras domestic markets 25 per cent. of the beeves exported from Truxillo.

It is a fact worthy of note that although exports from the ports of the north coast increased in 1883–84, there was in the total exports of that year a decrease of 11,524 cattle. Another curious fact is that, while exports by way of the north coast shrank from 25,181 cattle in 1883–'84 to 4,988 in 1884–'85, the total exports through other customs districts appear to have increased only 3,943 during that year.

These facts seem to warrant the inference that the supply of cattle is increasing rapidly in Honduras. This inference seems to be the more

likely, since it is probable that few if any female cattle were represented by the figures above quoted, because the export duties imposed upon cows were so heavy as to be prohibitory.

CATTLE CENSUS OF HONDURAS.

Assuming that the average annual supply of beeves in this country equals the number exported in 1882–'83, the supply would now be 27,684 greater than it was at the close of the month of July, 1883.

No official data later than the statistics for the year 1881–'82 are at hand showing the number of cattle in Honduras. At the time named there were reported 168,750 cows having young calves by them; 191,283 cows not suckling their young; 44,629 heifers, and 139,018 calves. These figures show that there were at that time 404,662 cows nearly or quite all capable of bearing young. If it be estimated that the average annual increase of females that have since 1882 come into bearing has equaled 40 per cent. of the supply of cows on hand at that date, there would now be nearly or quite 600,000 cows in bearing in this Republic. The highest official authorities in Honduras confidently assert that the above statistics represent at most no more than one-half of the cattle production of the Republic. It is but reasonable to conclude that if their opinion is well founded the country can now produce 400,000 beeves per year. On the other hand, if the statistics are nearly correct, then it is safe to assume that the average yearly production of bulls is more than 240,000.

MATURITY OF HONDURAS CATTLE.

Cattle here reach maturity at a late age. As a rule heifers are three years old before they produce their first calves; and bulls go until this age before castration, and are four, five, or six years old before they are slaughtered for beef. It might be reasonably supposed that beef from animals so treated is tough and stringy and of poor flavor.

BUTCHERING AND COOKING.

It is not likely that there is in all Honduras a butcher's block, or saw, or cleaver. A slice of steak or roast of neat shape is rarely, if ever, seen. The meat is haggled from the bones in shapeless pieces, and these, within three or four hours after the death of the bullock, are cooking in the earthen pottery, which here supplies the place of iron cooking utensils.

THE OUTLOOK FOR CATTLE-RAISING IN HONDURAS.

That Honduras offers many and great natural advantages to cattlemen cannot be doubted. If a home market to absorb the surplus beeves should be created, as by the establishment on the coast of a canning factory, this country would equal, if in truth it would not far surpass, any part of the United States as a cattle-growing region. Here no epizooty or other disease of a serious nature has ever existed; no storms, or snows, or hard winters; but spring, alternating with summer, and both ever redolent of healthful perfumery and balmy breezes, which play over broad prairies, covered by succulent grasses, and watered by crystal streams and refreshing showers.

D. W. HERRING,
Consul.

UNITED STATES CONSULATE,
Tegucigalpa, March 24, 1886.

THE ARGENTINE REPUBLIC.

THE CATTLE INDUSTRY OF THE ARGENTINE REPUBLIC.

REPORT BY CONSUL BAKER, OF BUENOS AYRES.

I have to acknowledge the receipt of the circular of the Department of State, dated the 18th of July last, asking information relative to the breeding-cattle of the different stock-growing countries of the world, and annexing a series of forms to be filled with details in regard to breeds, size, weight, average product of milk, butter, cheese, meat, &c., together with topography and conditions of climate, quality of soil, kinds of cultivated grasses, and methods of handling, &c., in the localities where they are raised, these reports being requested with a view to the importation of new breeds into the United States for the purpose of improving our own stock.

MILK, BUTTER, AND CHEESE IN THE ARGENTINE REPUBLIC.

In reply I have to state that the information sought has no application whatever to the Argentine Republic, since there are no breeds here which it would be worth while to import into the United States. The raising of cattle is, next to wool-growing, the most important industry in this country, but the stock is exclusively *creole*, and, so far as the topics suggested in the circular are concerned, there is nothing whatever to communicate which would be of any use to the stock-breeders at home.

It may seem paradoxical, yet it is true that while the Argentine Republic contains about 12,000,000 of horned cattle, it produces neither milk, butter, nor cheese, while the beef itself is, generally speaking, so inferior, at least in this part of the country, as to be the subject of universal execration. Such a thing as a dairy farm is unknown; such a thing as butter-making, in the true sense of the word, is a myth; such a thing as a cheese-factory, if we except a cheap curd produced in Goya, has never been attempted. In this immediate neighborhood you may or you may not find milk enough for your coffee, but not elsewhere. Nobody, with rare exceptions, keeps a milch cow. Butter, if it is used at all, has until very recently been brought from Italy. Of late years, an unsalted butter, the work of Spanish Basques settled near Buenos Ayres, has been finding its way to market, but it is nothing more than coagulated cream, while the cheese comes mostly from England or Germany. Not long ago I visited an estancia stocked with 15,000 cattle, and we did not have a mouthful of butter for our bread, while our coffee was seasoned with condensed milk from Illinois.

ARGENTINE CATTLE RAISED EXCLUSIVELY FOR SLAUGHTER.

Cattle have never been raised in the Argentine Republic, either for the milk, butter, or cheese they might produce, but exclusively for slaughter; and their only product, for export entirely, is hides, horns, bones, sinews, and a kind of jerked beef (*charqui*) which finds a market in Brazil and Cuba for the slaves. The science of husbandry is without any development in the Argentine Republic. During all the years which have elapsed since its conquest by the Spaniards, no attention what-

ever has ever been paid to the improvement of the breed, and the horned cattle which to-day feed upon the natural pasturage of the pampas are the descendants of those with which the country was originally stocked.

INTRODUCTION OF HORNED CATTLE INTO THE RIVER PLATE.

This occurred about the year 1550. According to the American archives in Seville,* Don Pedro de Mendoza was the first who introduced horned cattle into the regions of the Plate. He brought for the colony which he founded sixteen cows, two bulls, thirty-two horses and mares, twenty goats, forty sheep, and eighteen dogs. It is further related, according to details given by Ruy Diaz de Guzman, that Ayola and Martinez de Irala, the chiefs of the expedition, took several of these animals with them to the interior, and that others were lost in the wastes which are found in the delta of the Parana River near the present village of San Fernando. A little later, 1553, two brothers named Goës, who came in company with Alvar Nuñez Cabeza de Vaca, from Brazil, brought their cattle, consisting of eight cows and a bull, with them to Asuncion, Paraguay, where the new acquisition was received with great enthusiasm.

From these two sources have descended the horned cattle which in innumerable herds now form the stock of the Argentine plains. From that time to the present day the increase has been spontaneous, the mild climate and succulent grasses of the pampas being all the conditions required for their rapid multiplication and diffusion. But thus left to themselves, they have been permitted to degenerate by continuous breeding-in, without any effort ever having been made to improve their original good qualities, until now, after a lapse of three hundred years, they are without any of the characteristics which would make them a desirable acquisition to cattle-breeders, unless perhaps it be the quality of their hides, which the rough life they have encountered have made stronger and tougher than most hides which find their way to the markets of the world. In other respects, however, they have little to recommend them in countries where stock-breeding has had any development.

WILD CATTLE OF THE PAMPAS.

The cattle of this country came originally from the south of Spain, and are said to exhibit still the characteristics of the breed of that locality, the range between the 22° and 42° of south latitude, in this country not having exercised much influence upon them. Indeed they are as robust on the plains of Oran, the borders of the Vermijo, and in the subtropical forests of Misiones as they are on the pampas of Buenos Ayres. Their size, however, depends very considerably on their pasturage. It is smaller on the dry and arid plains of Catamarca and Santiago del Estero, and larger on the luxuriant grasses of Buenos Ayres and Banda Oriental. It was not until the beginning of the seventeenth century that their diffusion over the pampas of Buenos Ayres began to attract attention. The Indians, who inhabited those plains, and who up to the time of the conquest had no domestic animal, soon learned the value of the horse, and used it fearlessly in their chase of the deer, the ostrich, and the guanacho, but they paid little attention to the new cattle, which were increasing so rapidly around them. Indeed it appears that while they used the flesh of horses, whether domestic or wild, for their ordinary food, they had no relish for beef, and it is only since a comparatively recent period that the Péhuenches and other

* Domingues's History of the Argentine Republic.

tribes living on the eastern slopes of the Andes commenced to use horned cattle for food,* though they still prefer horse meat. In those early days nearly all the cattle on the pampas were wild (*alzados*), and most of them without owners. The reverse is now the case, and they are comparatively tame, that is to say, they are accustomed to the presence of men and allow themselves to be guided by them.† Even at the epoch referred to, over a million hides were annually exported from the Plate. The cattle-farms, or *estancios*, however, only contained a small proportion of tame animals, the rest being wild were pursued on horseback for their hides.

The manner of killing them was as follows: The mounted gauchos, carrying in their hands a lance, with a sharp horizontal knife in the end, gave chase to the animals, and approaching them on the full gallop, cut their hamstrings as they ran, bringing them down with an address and dexterity which were astonishing. When they had thus secured a sufficient number, they returned and gave the *coup de grace* to the prostrate animals by severing, with a perpendicular thrust, the spinal cord just back of the horns. When the slaughter was completed, they removed the hides, which they stretched on the ground with pins, and abandoned the carcasses to the dogs and birds of prey. This system of slaughtering is still sometimes practiced on animals whose poor condition make them of no value except for their hides. In such cases they are driven to the neighborhood of the slaughter-house; and, after being skinned, their bodies are used for fuel for the boilers, while their bones are pulverized for manure.

NUMBER OF HORNED CATTLE IN THE REPUBLIC.

The business of horned cattle has formed for nearly three centuries the sole occupation of Spanish settlers and their descendants, and it is still almost exclusively in the hands of the natives, as sheep-farming is in that of foreigners. It is the general impression that the number of horned cattle now in the Argentine Republic is not so large as in former years, owing to the immense slaughter, principally for their hides, which has heretofore been carried on. There are, however, no statistics based on actual count to prove this fact. I give below the number supposed to have been in the Republic in 1869, compared with the number estimated for each province in 1881:

Province of—	Number in 1869.‡	Number in 1881.§
Buenos Ayres	5,116,029	4,754,810
Entre Rios	2,500,000	2,216,562
Santiago del Estero	1,200,000	200,000
Santa Fé	1,100,000	900,000
Corrientes	1,708,708	1,400,000
Cordova	652,470	1,043,000
Tucuman	305,228	304,700
San Luis	248,314	139,002
Catamarca	200,513	80,000
San Juan	28,561	65,493
La Rioja	72,043	100,000
Mendoza	64,878	100,108
Jujuy	93,270	50,000
Salta	143,010	200,000
Total	13,993,090	11,554,275

* Description géographique et statistique de la Confédération Argentine, par V. Martin de Moussy, vol. ii, p. 66.

† Captain Musters, in his book "At Home with the Patagonians," speaks of the immense numbers of wild cattle which are found without owners in the forests on the headwaters and tributaries of the Rio Negro, and the western slopes of the Cordilleras of the Patagonian Andes.

‡ Census of the Argentine Republic, 1869.

§ *Ibid.*, 1881.

ARGENTINE EXPORTS OF CATTLE PRODUCTS.

The importance of the cattle industry, in a commercial point of view, will appear from the custom-house statistics, since the entire product, after providing for a meager home consumption, finds a market abroad. According to those returns, the exports of the products of horned cattle stand for about one-third, while the exports of the sheep products stand for about one-half of the entire shipments abroad. To be more exact, it appears that of the total exports last year, 56.5 per cent. were wool and sheep-skins, 32.3 per cent. were the products of horned cattle, while only 11.2 per cent. were agricultural, mineral, forest, and manufactured products. The exports of the total pastoral industry, compared with all other exports, for the last seven years are shown in the following table, compiled from official sources: *

Exports from the Argentine Republic from 1876 *to* 1882.

Articles.	1876.	1877.	1878.	1879.	1880.	1881.	1882.
Pastoral products	$40,092,711	$38,208,064	$31,891,836	$41,351,831	$50,567,372	$57,770,303	$49,142,494
Agricultural products	428,063	602,642	485,802	2,156,187	784,423	1,495,935	4,241,669
Mineral products	200,823	217,544	154,872	363,025	2,407,324	402,763	508,591
Timber products	41,784	58,679	35,216	78,154	113,364	280,180	226,414
Manufactured products	5,726,588	4,212,639	3,722,538	3,754,473	2,386,414	1,592,313	3,844,837
Other exports	48,337	27,901	22,894	61,617	238,526	521,610	416,900
Total	46,539,206	43,327,469	36,313,158	47,795,287	56,497,423	52,069,104	58,440,905

As a matter of especial interest in connection with the cattle industry, I give below the shipments separately of each article produced during the last seven years, as taken from the custom-house returns:

Exports of cattle products from 1876 *to* 1882.

Articles.	1876.	1877.	1878.	1879.	1880.	1881.	1882.
Cow hides.....No.	2,324,866	2,488,532	2,238,802	2,336,529	2,701,299	2,192,370	2,945,427
Dried and jerked beef...kilos.	29,666,210	38,732,623	33,600,203	32,836,252	26,116,479	22,412,631	26,966,013
Bones and bone-ash.....do.	33,234,837	52,304,685	39,231,010	36,430,207	27,602,477	34,763,049	28,212,508
Horns.....do.	3,056,000	3,862,000	2,998,454	2,706,780	2,906,416	2,903,041	1,410,083
Hide-cuttings.....do.	1,031,486	1,122,152	880,204	908,369	1,242,784	781,709	879,183
Animal oils.....do.	216,149	891,066	815,592	422,625	300,381	199,278	542,603
Animals on the hoof.....No.	109,726	169,445	86,808	422,573	52,258	84,638	53,995
Salted beef.....kilos.	4,149	143,749	110,938	7,594	2,417	18,593	.....
Animal-black.....do.	.....	1,156,320	1,204,540	3,160,890	3,591,477	1,082,497	1,930,770
Artificial guano.....do.	2,627	.....	55,500	852,259	.....	124,450	1,111,945
Dried blood.....do.	28,793	.....	42,946	187,472	1,030	453,131	92,547

I would state that there is an export duty on all the above articles of 7 per cent. on the value, except salted beef, animal-black, artificial guano, and dried blood, which are free of duty; and that all horned cattle exported from the country pay a duty of 75 cents per head.

Of the above exports it appears from the custom-house returns that about one-third of the hides go to the United States, the rest to England, France, Spain, Belgium, &c.; that the jerked and dried beef goes principally to Brazil, Cuba, and Spain; that two-thirds of the bones and

**Estadisticas oficiales de la Republica Argentina*, 1876–1882.

bone-ash go to England, the rest principally to the United States; that the horns go to England, France, Italy, and Belgium; that the hide-cuttings go to Belgium, Germany, United States, and England; that the animal oils go to France; that the live animals go to Chili and Bolivia; that the animal-black goes to France; that the artificial guano goes to the United States and England, and that the dried blood goes to the United States.

The gradual decrease in the above shipments would seem to corroborate the general impression that there has been a decrease in the number of horned cattle in the country. According to the official estimates already mentioned, it appears that there are about 2,500,000 less in the Argentine Republic to-day than there were fourteen years ago. This count does not include the number in the territories of Patagonia, Gran Chaco, Pampa, and Misiones, which probably amounts to 300,000 more.

It will further be seen that over one-half are on the pampas of Buenos Ayres, Santa Fé, and Cordova, the rest being scattered in smaller numbers over the uplands of the interior, and the mesopotamian provinces of Entre Rios and Corrientes.

HOW CATTLE ARE MANAGED IN THE ARGENTINE REPUBLIC.

It may be said that the cattle of the country are now all tame, in the sense that they all bear the brand or mark of their owners, are accustomed to the range of the *estancia* to which they belong, and allow themselves to be handled by those whose duty it is to watch after them and make up the *rodeos*, that is, bring them to the place where they sleep at night. When the young bulls have been castrated they go by the name of *novillos;* and the number of bulls left entire is about one to every fifty cows.* It is very important that the men should constantly watch after the animals, for if left to themselves they soon become intractable and difficult to manage. Where the attendance is negligent, they are readily frightened at the sight of a horseman, and disastrous stampedes sometimes are the consequence. Where these occur, it is only with infinite pains that they can be restored to former docility.

When the number of bulls are allowed to become too numerous, furious and fatal combats not unfrequently ensue, the cows taking part in the deadly encounters, and thus the annual calving is apt to be reduced. A few years ago, during the civil wars in Uruguay and pending the long siege of Montevideo, a great portion of the cattle on the abandoned *estancios* having nobody to take care of them, returned to a wild state (*alzado*), and upon the restoration of peace, it was found absolutely necessary to kill all the old bulls and castrate the young ones in order to tame the cows and make them easier to manage; and even then it took an enormous amount of time and the ruin of hundreds of horses on each establishment, before the herds could be reduced to a tractable condition. And the same thing occurs wherever, for any cause, the cattle of an *estancia* are neglected. In a very few months they return to a wild state, thus entailing great losses on the owners.

With proper attendance and careful management, however, it is astonishing how easily the cattle of the Argentine Republic are handled. The bulls exhibit none of the ferocity which is characteristic of those of other countries, and even to supply the bull fights which are still allowed to be exhibited in Montevideo, it is necessary to import the bulls from Spain, those of the country not being sufficiently savage and fero-

* V. Martin de Moussy, vol. ii, p. 110.

cious for the purpose. The cattle here seem to have such an instinctive respect for a horseman that they run or yield at once, and seldom show any obstinacy or resistance to his authority. A person on horseback can quietly pass into the midst of the largest herds without fear, as the animals will always at once open their ranks before him; and they are so accustomed to see the people of the country dressed in clothes (*ponchos*) of bright hues, that the most glaring red colors do not enrage them.

One thing, which the *estancieros* have to guard against, where their herds are newly formed of cattle collected at different places, is the tendency of the animals to return to their former ranges; and frequently in cases of panic they scatter in all directions, and it is difficult to get them together again. This desire of cattle to return to the places where they were raised (*querencios*) is much stronger should the old pasturage be better or the country more saline, the latter quality of the soil greatly contributing to the increase of the herds of the river Plate. In no other way can be explained the remarkable fact that in places where there is a lack of salt, notwithstanding the beautiful appearance of the pasturage, such as for instance is found in the southeastern parts of Paraguay and in the provinces of Saint Catherine's and Saint Paulo, Brazil, those parts of South America are not so suitable for the raising of cattle as the pampas of Buenos Ayres, or even the mesopotamian provinces of Entre Rios and Corrientes. In these regions, in spite of the dryness and even aridity of the soil in some places, and of a pasturage which is meager in appearance, the reproduction is so considerable that it is estimated that a herd of cattle will double in three years. It is to this quality of the soil that the beauty of the cattle on the Vermijo River is attributed, where, notwithstanding the exceedingly warm summers and the great annoyance from flies and mosquitos, they are fully as large as those in the province of Buenos Ayres, and are seldom attacked with epizooty.

WORKING CATTLE AND MILCH COWS.

Owing to their natural docility, the taming of work cattle is accomplished without difficulty. They allow themselves at once to be put to the plow or the wagon, though the manner of yoking them by the head, which prevents them from using their horns, may greatly assist in their domestication.* If they are not so strong or robust as those we have at home, it is only because their food is less substantial; for, even while performing the longest journeys, they have no other nourishment than the grass they can pick up, when they stop to rest, on the pampas; and this is generally very scant along the highways or near the villages. Properly fed these animals, which are large and muscular, would be capable of much more unremitting work.

For the same reason the cows give but little milk, and then only when the calf is present; and it generally dries after three or four months. On this account milk is almost unknown in the interior of the country, in spite of the immense number of cows, and no butter is to be obtained except in the immediate vicinity of the river towns, where the cows in a few cases are stabled and fed.

* The ox-yoke of the Argentine Republic is a simple bar of hard wood, slightly hollowed out on the lower side, laid across the heads of the animals and lashed to the horns by hide thongs. The Argentines insist that an ox can pull greater loads by his horns than by his shoulders, but I doubt it entirely.

WINTERING CATTLE.

Living entirely in the open air, and having no protection whatever, no matter how severe the weather may be, and depending solely upon the natural grasses of the country for their nourishment, the cattle become very lean during the winter months especially if there has been a drought during the summer, thus preventing the growth of vegetation. Thus reduced in flesh, they become very susceptible to the cold; and under such circumstances, when driving rain or snowstorms occur, with the wind from the southwest, hundreds of thousands have been known to perish in a single night.* In the spring they at once begin to improve, though the young grass is so watery at first as to cause violent purging; and many cattle are sometimes lost from this cause, especially if they are in poor condition. The skins of cattle that perish from these or other like causes are always removed, and are sold in the market under the name of *epidemia* hides, though of course the word is not intended to convey the meaning that the animals died from an epidemic disease, which seems to be the impression abroad. So soon as the succulent grasses of the pampas begin to mature, that is, during the months of November and December, the cattle begin to improve.

FROM THE ESTANCIOS TO THE SLAUGHTER-HOUSES.

The moment they have acquired sufficient strength and condition, and will stand the long drives, the *novillos* are separated from the rest of the herd and sent to the slaughtering establishments (*saladeros*) or the city market (*mataderos*), an operation which sometimes requires a large number of men (*peones*) and much care; for pastured cattle are apt to be quick in their movements, and a very little thing will cause them to stampede in disorder and regain their old range. On the other hand, unless occasional rests and breaks in the journey are permitted, since the distance to be traveled is not unfrequently hundreds of leagues, the animals become tired and the meat loses its natural taste (*bon goût*). I may add, however, that in the markets of Buenos Ayres "tired" meat is the rule instead of the exception. It is on account of these long drives, without water or food at proper intervals, that the beef sold in the cities does not in any respect compare with that which you can obtain on the *estancios* themselves, where ordinarily it is of most excellent flavor.

REQUISITES OF AN ESTANCIA.

A cattle *estancia*,† in order to be considered first class, requires three conditions, good quality of grasses, an abundance of water, and range sufficient to hold and feed a large herd—conditions which, from the beginning, the Spanish colonists seem to have well understood, in the selections of the lands upon which are to-day be found the great cattle farms of the country. The development, however, of the wool industry during late years has had a tendency to drive the cattle farmers farther

*Mr. Darwin in his "Naturalist's Voyage Around the World," page 133, says: "While traveling through the Argentine Republic, I received vivid descriptions of a late great drought, during which time so little rain fell that the vegetation, even to the thistles, failed, the brooks were dried up, and the whole country assumed the appearance of a dusty highway; very great numbers of birds, wild animals, cattle, and horses perished for the want of food and water. The lowest estimate of the loss of cattle in the province of Buenos Ayres alone was taken at one million head."

†Mulhall's Hand-Book of the River Plate.

out from this city, the inner "camps," which furnish soft grasses being in demand for the grazing of sheep. It is still easy to obtain most excellent *estancia* lands in the outside *partidos* (counties), while the Government sells its lands on the frontiers at prices which are considered reasonable, but the demand for places in those localities is increasing every year, and it now requires no little capital to buy and stock a cattle farm anywhere near to a market.

Estancios for horned cattle usually vary from 1 to 10 square leagues in extent, while those on the frontiers are even much larger. The *estanciero* takes care to select a piece of land, if possible, bordered by a river or having water courses (*arroyas*) running through it or permanent lakes (*lagunas*) of fresh water, and as free as possible from hemlock and burr. The grass of a stock farm is what is called *pasto fuerte* or coarse grass, which stands the dry seasons better than the meadow grass or trefoil on which sheep are pastured, and which does not begin to appear until the coarse grass has been entirely eaten down.* In building his house the owner is guided by his taste or his means. In former times, and it is still the case in some parts of the country, the *estanciero* lived in a mud hut without a window, nowadays very luxurious residences can be found, even on the frontiers, furnished with every modern convenience.

The corrals, generally near the house, are large folds for inclosing the cattle when necessary, and are most important appendages to an *estancia*. They are made of upright posts of hard wood, 7 feet high, fastened together by means of cross-bars and hide thongs. They are generally oval or circular in form and strongly made, so as to securely hold a large number of cattle, the gate consisting of two or three transverse bars. The grounds (*monte*) immediately surrounding the house generally comprise from 10 to 50 acres, wired in, with a ditch on the outer side, and consist for the most part of timber and fruit trees—generally peach, for the reason that they are such rapid growers, arriving at maturity in three years and serving the double purpose of fruit and fuel, besides making fences.† These patches of timber are landmarks on these unending plains, visible for many miles, and at a distance look like green hills, whence the name which is given to them. In peach *montes* one-third of the plantation is cut down at intervals, and is allowed to grow up afresh from the stump; and in this manner the supply of fruit and timber is constant and abundant. Such a thing, however, as a vegetable garden is almost unknown. The staff of an *estancia* usually consists of a superintendent called major-domo, who represents the owner; a *capitaz* to oversee the peons or laborers, and from five to twenty of these peons, according to the size of the *estancia*, who earn from $10 to $25 per month.

Where an *estancia* is very large in extent and the cattle are numerous, there are established, at corresponding distances from each other

* In reference to this change from coarse to soft grasses produced by the pasturage of horned cattle, Mr. Darwin (Naturalist's Voyage Around the World, p. 118) says of the Argentine pampas: "I was very much struck with the marked change in the aspect of the country after having crossed the Solado River. From a coarse herbage we passed on to a carpet of green verdure. I at first attributed this to some change in the nature of the soil, but the inhabitants assured me that the whole was to be attributed to the manuring and grazing of the cattle. Exactly the same fact has been observed in the prairies of North America, where coarse grass, between 5 and 6 feet high, when grazed by cattle, changes into common pasture land. I am not botanist enough to say whether the change here is owing to the introduction of new species, to the altered growth of the same, or to a difference in their proportional numbers."

See Mr. Atwater's account of the prairies, in Silliman's Journal, vol. i, p. 117.

† On many *estancios* poplar, eucalyptus, and willow plantations are now very common.

and from the *estancia* house, a number of smaller houses, called *puestos*, with their appropriate surroundings of corral, *monte*, &c., where a peon with his family resides and has charge of a portion of the cattle. By means of these sub-establishments the animals are more evenly distributed over the grounds for grazing purposes and do not crowd each other, but they are always in daily communication with the major-domo.

NUMBER OF ANIMALS AN ESTANCIA WILL MAINTAIN.

The number of animals which can be supported on a square league of land varies a great deal, and depends upon the quality and quantity of the grass. Where the pasturage is heavy and nourishing, that amount of land will very readily sustain 3,000 horned cattle, and even more, together with all the working cattle, horses, mares, and sheep intended for the use of the establishment. On a "bad camp," * however, where the grazing is limited, owing to *saliras*, *saladas*, and other causes, whereby the vegetation is not luxuriant, the number of animals must be correspondingly reduced; and even then, in times of drought, it frequently happens that the cattle die of starvation, unless they are promptly removed to a better pasture. It is generally assumed in the province of Buenos Ayres that 9,000 square yards are required to sustain a bullock the year round, but this only refers to those *estancios* which have an abundance of both grass and water. Otherwise the estimate at the present day is too large.

HOW THE STOCK IS HERDED.

The stock of an *estancia* of course depends upon its extent, but often numbers 10,000 and even 15,000 head, divided into herds of 2,000 or 3,000 each, each herd being gathered up every night in its own *rodeo*, an open space where each animal regularly chooses its own place to lie down. Here they remain until morning, when they again set off to graze. In seasons of drought cattle sometimes stray great distances in search of water, but unless they calve on their new pastures they will return to their former range. Sometimes where there is scarcity of water, the cattle are watered by a *balde sin fondo*, a hide bucket, which is worked by a man on horseback in a very primitive fashion, the bucket being pulled up over a wheel and thus emptied of its contents into a long trough. In this manner one person can water 2,000 cattle per day.

To one who sees for the first time a cattle *estancia*, the facilities with which large herds are managed is a source of continual wonder. The animals need no immediate personal supervision whatever, saving at most a daily gallop by a peon around the boundaries of the land; and in order to bring them to their *rodeos* all that is necessary is for a peon to set out on horseback, cracking his whip and shouting at the pitch of his voice, and the cattle at once stop their day's feeding and troop off to their appointed place—and all this in an open plain where fences are almost unknown.† The *gauchos* evidently understand the natures of

* "Camp," used in ordinary conversation by everybody in the Argentine Republic, is a contraction of the Spanish word *campo* and means "the country."

† "The operation of counting the cattle on an *estancia* would be thought difficult, where there are ten or fifteen thousand head together, but it is managed on the principle that the cattle invariably divide themselves into little troops of from forty to one hundred. Each troop is recognized by a few peculiarly marked cattle and its number is known; so that one being lost out of ten thousand, it is perceived by its absence from the *tropellas*. During a stormy night the cattle all mingle together, but the next morning the *tropellas* separate as before, *so that each animal must know its fellow out of ten thousand others.*" (Darwin, page 145.)

horned cattle, for the manner of subjecting them to the dominion of man is so easy and so perfect that it has never been improved on by the numerous foreigners who have turned their attention to cattle-breeding in this country.

CATTLE VERSUS SHEEP.

The rearing of cattle is much less laborious in the Argentine Republic than that of sheep; but the latter pursuit is considered as the most lucrative, for the reason that five or six sheep can be maintained on a pasturage that would feed only one bullock. Notwithstanding this advantage and the fact that sheep reproduce themselves in a much shorter time, the natives prefer cattle farming, either from the fact that a much smaller outlay of money is needed, or because no care or study is necessary to render the pursuit successful. The two industries, however, do not at all conflict, for the reason that, while sheep are raised only in parts of the country where the soft grasses abound, the cattle farms are farther out and consist of the harder grasses. In many places, however, the two industries, as also that of breeding horses for slaughter, are more or less combined. The management of an *estancia* is a very simple routine of daily care, involving no hard work whatever. Almost everything is done on horseback, every man, woman, and child belonging to the establishment having their own horse, which is generally kept saddled all day long at the *palenque* (a row of posts with a horizontal bar) ready for service at a moment's notice. No one thinks of walking even a few hundred yards; and it is not uncommon to see a man mount a horse to go to the opposite side of the road.

MARKING THE YOUNG ANIMALS.

The great business of an *estancia* is the marking and castration of the animals. This occurs generally in the months of May and June, the season when the flies have disappeared and the weather has become cool. The young cattle are altered at two years of age, and the losses resulting from it are about 4 per cent. The marking is done at the same time, and it is a season of great amusement in camp-life. All the peons of the establishment and many others from the neighborhood assemble in full force. The cattle are driven into the *corrals*, and each animal in turn is caught over the horns with a lasso by a man on horseback; another lasso (or the "*bolas*") is quickly passed around his hind legs, which at once throws him to the ground, and the operation is completed in a moment. Then a red hot iron bearing the owner's monogram or mark, the purport of which is duly registered in the proper office, is firmly planted upon the poor brute's flank, while a blue smoke curls upward from the palpitating flesh, thus leaving a mark which is indelible. This is the only way that the owners can distinguish their cattle, there being no bounds or fences to the various *estancias*, and in case of sale they must also have the brand of the purchaser. These brandings are often done so bungingly, or made so deeply that they greatly injure the hide for commercial purposes. The day's work, called *yerra*, always winds up with a feast of meat cooked in the hide (*carne con cuero*), than which nothing can be more savory or delicious. No coals or wood, but only bones are employed in cooking it, each man with his own sheath knife cutting off the piece that suits him best.

HORSEMANSHIP AND DEXTERITY OF THE GAUCHO CATTLE HERDERS.

The *peons* or *gauchos* generally take advantage of these merry makings to show off their prowess or their accomplishments. The horse-

manship of the *gaucho* is wonderful. On his saddle (*recado*), chiefly made of untanned horse-hide and sheep-skin, he sits with the consciousness that he is the horse's master. Indeed it is seldom that he puts his foot in a stirrup—for the purpose of riding, never. And his dexterity in throwing the lasso is equally astonishing. His aim is almost unerring. Singling out a horse or a cow in the middle of a herd, he will bring him down with unfailing precision. He will pursue an animal in full chase across the plains, and when sufficiently near, he swings his lasso twice or thrice around his head and then lets it go. The moment it touches the runaway cow, the horse of the rider stops to receive the shock, and and down goes the cow headlong to the ground. Another way which he has of securing cattle is with the "bolos." These consist of two balls (iron or stone) covered with hide and fastened at the end of two short rawhide ropes, and thrown by means of another short thong, all three being secured together. They are twirled around the head like the lasso, and thrown at a distance of 60 or 70 yards with great precision; when, entangling the feet of the pursued animal, it is brought to the ground with a violent shock. He is also exceedingly clever in plaiting bridles of untanned hide thongs, and his great ambition is to caparison his horse with elaborate silver trappings, worth sometimes several hundred dollars; and when on horseback, dressed in his fantastic costume of striped loose fitting *chiripás* and his scarlet vacuña *poncho*, falling gracefully over his shoulders down to his hips, he presents an appearance which would attract attention anywhere. With the termination of the feast, they indulge in indiscriminate horse racing, and not unfrequently, for betting is a besetting sin with the whole race, by nightfall our gaucho has not only lost all his month's wages, but also his horse, and it may be even his poncho. With many of these singular people, however, this is scarcely looked upon as a misfortune; and they are not slow in recouping their losses by appropriating the first horse that attracts their fancy.*

THE GREAT SLAUGHTERING ESTABLISHMENTS.

When the cattle of an *estancia*, as I have already stated, are in sufficiently good condition from the spring pasturage to be able to undergo the journey, they are sent off in lots either to the slaughter-houses of the city (*mataderos*) or to what is known as the *saladero*. This is an establishment where cattle are slaughtered in large numbers, and all the product of the animal, meat, hide, grease, bones, horns, and other refuse, is collected and prepared for exportation. The erection of one of these establishments requires the outlay of no inconsiderable capital, and to be successful it must have an intelligent and economical organization. Without these, as the running expenses are always large, the business not infrequently fails to give such profits as are commensurate with

* Ex-President Sarmiento, in his book "*Civilizacion y Barbarie*," page 23, says: "The gaucho does not labor, he finds his food and raiment ready to his hand. If he is a proprietor his own flocks yield him both. If he possesses nothing himself, he finds them in the house of a patron or a relation. The necessary care of herds is reduced to excursions and pleasure parties; the branding, which is like the harvesting of farmers, is a festival, the arrival of which is received with transports of joy, being the occasion of the assembling of all the men for 20 leagues around, and the opportunity for displaying incredible skill with the lasso. The gaucho arrives at the spot on his best steed, riding at a slow and measured pace; he halts at a little distance and puts his leg over his horse's neck to enjoy the sight leisurely. If enthusiasm seizes him, he slowly dismounts, uncoils his lasso, and flings it at some bull passing like a flash of lightning forty paces from him; he catches him by one hoof, as he intended, and quietly coils his leather cord again."

the investment. On account of the amount of money required to start a *saladero*, the majority of them in the Argentine Republic are the property of joint-stock companies, many foreigners who know the economic uses to which all the parts of the animal can be applied, having large capital invested in these industries. As I have said, the time is passed, when cattle were killed solely for their hides, and their carcasses were left to rot on the pampas. Now all the appliances of European science and art are brought into requisition, and the entire animal is utilized.

One of the first conditions of a slaughtering establishment is that it should be near a navigable water-course, where the largest sea-going vessels can anchor and receive the product. Those in this country are located on the Uruguay, Parana, and La Plata Rivers. Several very extensive ones are at Ensenada, where is a fine bay, large enough to receive a fleet of vessels. Another condition is the possession of immense pasture grounds supplied with an abundance of water, so that the animals, tired out by their long drives on the road, may be allowed to rest and recuperate before going to their slaughter, for, independent of the worthlessness of tired meat, the hide is with difficulty removed from such animals, being easily cut during the operation, thus resulting in unsalable stock. It is also necessary to build deposits, respectively, for the salt, the meat, the hides, and the tallow; a long open shed for cutting and salting the meat, and offices for overseer, peons, &c., all of which are located conveniently to the slaughter-house proper.

In well-organized *saladeros* there are usually three corrals, the first and largest being built of very strong stakes or brick walls, opening widely to receive the herds driven slowly in by the peons. The second corral joins this and is only large enough to hold a number sufficient for the day's slaughter; and the third still smaller, and opening into the preceding, holds about twenty head at a time, and terminates in a narrow passage, through which there runs, on a level with the pavement, a platform car on iron rails. Around this small corral there is a high gallery on which one can walk, while a bridge passes over the railway passage, which is closed with folding doors. Through a pulley above these doors is placed a long lasso, the running knot of which is in the hands of the executioner, the other end attached to a yoke of oxen led by a boy. The executioner throws the lasso and catches the nearest animal around the horns, and calls to the boy to pull. Thus the animal is dragged instantly onto the platform, where instinctively he rests his head against the doors, when the man plunges his knife into its neck between the occipital and first vertebræ, thus severing the spinal cord. The animal falls dead, the door opens, and the car is drawn outside, the doors closing behind the carcass, which is at once deposited upon a paved way, and the car is returned to its place, and another animal lassoed.

The *maneuver* is done with extreme rapidity. The animals lying on the pavement are bled immediately, the blood running in a trough to a special tank and dried or made into artificial guano. The process of skinning the animal occupies but a moment. It is then cut into quarters, hung in an open shed on hooks, and then cut up into small strips, so that nothing remains but the bones. The meat thus cut up is piled under thick layers of salt several feet high. During these operations a part of the grease is put aside, while the bones of the limbs and carcass are removed to great wooden tubs, heated by pipes conveying the steam from the boilers, thus extracting all the grease which may remain. These vats are capable of holding upwards of thirty carcasses. The hides are salted and piled like the meat. The paunch and intestines are made into guano. The tongues, hoofs, tails, ears, horns, hide-cuttings, &c.,

re consigned to their respective receptacles. When the skeletons are removed from the boilers, all the grease has disappeared from them, only a few ligaments and remnants of flesh remaining. The larger bones, used for manufactures, are then separated, and the rest are used for fuel, the bone ashes being collected in barrels and sold abroad for manure.

In the space of about five minutes after it is slaughtered, the animal has entirely disappeared. As to the meat, when it has become well penetrated by the salt, after repeated turnings, at the end of about five days, it is placed in an inclosure on horizontal lattice work, and thus perfectly dried. After this it is piled in the open air upon a brick platform and covered with hides to protect it from birds of prey, or to await its sale. For transportation it is put up in barrels or bales securely pressed. The grease, after having been refined, is run into pipes and sold by weight. Some *saladeros*, to utilize the grease and tallow, have soap and candle factories annexed to the establishments.

Such is a general *résumé* of the usual operations of a *saladero* in good condition. Ordinarily they can slaughter and take care of four hundred animals per day, the work beginning at daylight. The men engaged in these establishments possess a wonderful dexterity in their several departments, and operate with a rapidity which is astonishing. The season for active work begins at the end of the spring months, either in November or December, when the animals are fat and can be slaughtered to the best pecuniary advantage, and it comes to a close when the frosts or the drought begins to cut down the pasturage. There are now in the Argentine Republic not less than twenty-one of these great slaughtering establishments, as follows: Eight in the province of Entre Reos; one in the province of Santa Fé, and twelve in the province of Buenos Ayres, together representing a capital of over $6,000,000. The annual number of animals slaughtered varies considerably, but generally reaches in this part of the River Plate to a million head, though in the last year or two this industry seems to be languishing.

CITY SLAUGHTER-HOUSES IN THE ARGENTINE REPUBLIC.

In the city slaughter-houses (*mataderos*) there is but little of the system which belongs to the *saladeros*, while there is displayed a great deal more cruelty to the animals. Those of Buenos Ayres are located to the southwest of the municipal limits and consist of a large number of corrals or pens surrounding an extensive inclosure in which are arranged the necessary buildings and sheds. The animals are lassoed in the pens by a man on horseback, and they are then forced through the corral gate into the inclosure, bellowing and plunging in every direction in a vain effort to escape. Sometimes the animals are thrown down by another lasso passed around their hind legs, when they are readily dispatched; but in most cases the butcher with an immense knife in his hand takes his opportunity to hamstring the brute before him, thus at once bringing it to the ground, when the knife is driven into its neck behind the horns, severing the spinal cord. Frequently, however, the hamstringing is only partially done or unsuccessfully attempted, and the bleeding animal, infuriated in its struggle for freedom, the chance of which is lessened every moment by the tightened lasso, the wounded leg, and the loss of blood, suffers all sorts of torture from men and dogs before it finally succumbs to its fate. This same brutal operation is at the same time going on in each one of the corrals; while scattered at intervals in the inclosure a number of men are engaged in skinning and disemboweling the animals while others are cutting up and

placing the carcasses in carts for the different city markets. The sight is a most repellant one, and no person with weak nerves or a humane heart would care to witness it twice. All these city establishments are under the control of the municipal authorities, not merely for the collection of the taxes on each head but to inspect the meat; but the latter duty is most carelessly attended to, and the amount of unhealthy beef which is sold in the city of Buenos Ayres is, according to the physicians, little less than appalling.

EFFORTS TO IMPROVE THE ARGENTINE BREED.

Thus far in my report, I have exclusively referred to the native (*creole*) breed of cattle of this Republic.* I have done this for the reason that scarcely any other kind reaches the slaughtering establishments. It must not be understood, however, that there are no blood cattle in the country. During the last few years very commendable efforts have been made, especially in the province of Buenos Ayres, to improve the breed, and some of the best breeding stock of Great Britain has been imported, in some cases commanding extravagant prices. These have mostly been Shorthorns or Durhams, though more recently some valuable acquisitions of Hereford bulls have been made. The effect of these crosses with *creole* cows cannot yet be fully determined. So far as the milk-producing qualities of the cross is concerned, of course there is no question; but milk is just now a matter of small consideration among *estancieros*, who never milk a cow.

On two points, however, there is a very serious question. These are, first, the quality of the hides produced by the cross; and, second, the ability of the cross to "rough it" during the long winter months.

* Mr. Darwin, in his "Naturalist's Voyage around the World," page 146, describes a very curious native breed which he says he met with on two occasions on the Upper Uruguay River. I have never seen the breed, but I give his description. He says: "They are called *nāta* or *niata*. They appear externally to hold nearly the same relation to other cattle which bull or pug dogs do to other dogs. Their forehead is very short and broad, with the nasal end turned up and the upper lip much drawn back; their lower jaws project beyond the upper, and have a corresponding upward curve; hence their teeth are always exposed. Their nostrils are seated high up and are very open; their eyes project outward. When walking they carry their heads low, on a short neck; and their hind legs are rather longer compared with the front legs than usual. Their bare teeth, their short heads, and upturned nostrils give them the most ludicrous self-confident air of defiance imaginable. Since my return, I have procured a skeliton head, which is now deposited in the College of Surgeons. Don F. Muniz, of Luxan kindly collected for me all the information which he could respecting this breed. From his account it seems that about eighty or ninety years ago they were rare and kept as curiosities at Buenos Ayres. The breed is universally believed to have originated among the Indians, southward of the Plata, and that it was with them the commonest kind. Even at this day those reared in the provinces, near the Plata, show their less civilized origin in being fiercer than common cattle, and in the cow early deserting her first calf, if visited too often or molested. It is a singular fact that an almost similar structure to the abnormal one of the *niata* breed, as I am informed by Dr. Falconer, characterizes that great extinct ruminant of India, the servitherium. The breed is very *true*, and a *niata* bull and cow invariably produce *niata* calf. A *niata* bull with a common cow or the reverse cross, produces offspring having an intermediate character, but with the niata characters strongly displayed. When the pasture is tolerably long, the *niata* cattle feed with tongue and palate, as well as common cattle; but during the great droughts, when so many cattle perish, the *niata* breed is under a great disadvantage, and would be exterminated if not attended to; for the common cattle are just able to keep alive by browsing with their lips on the twigs and reeds; this the *niatas* cannot do so well, as their lips do not join, and hence they are found to perish before the common cattle. This strikes me as a good illustration of how little we are able to judge from the ordinary habits of life, on what circumstances, occuring at long intervals only, the rarity or extinction of a species may be determined."

In regard to the first point, I have the opinion of a large buyer of hides, that so soon as the cross with Durham bulls became appreciably felt in number, the price of Argentine hides would fall, owing to their depreciation in quality. At present, I believe the hides of this part of South America stand pre-eminent for their strength; and it hardly seems reasonable to suppose that to cross the native stock with a breed which has for a century or more been carefully wintered and pampered will have the effect to improve the quality of the hide. The reverse would naturally seem to be the effect. For this reason there is a growing preference manifested for the Hereford bulls, on the ground that they have been bred in a more natural way, have a far stronger hide than the Durham, and can better take care of themselves on the great plains of the Argentine Republic. For it must be borne in mind that no provision is ever made in this country for protecting cattle from the weather. Such a thing as cattle sheds or winter feeding is entirely unknown, and the cold winds and severe storms which come over the southwestern Andes prove fatal to immense numbers of the native cattle every year. And it cannot be considered strange if the offspring of blooded stock, which have received the best treatment of Europe, should be unable to retain a vigorous and healthy constitution under the hard conditions which they are subjected to here.

So far as the second point is concerned, it is probably true that the Herefords are better able to stand the winters of this country than the Durhams, but it is certain that neither has the enduring qualities of the native cattle that for three hundred years, through all sorts of rough weather, have become accustomed to look out for themselves. And it must be admitted that, so far as body and weight are considered, the native breed has much to recommend it besides its hide. In some respects these cattle remind me of what at home we call the Texas or Arkansas "stags," tall and long-bodied, with immense spreading horns, of no prevailing color, but of all colors; and when well filled out by the rich pasturage of the pampas they present a most stately, not to say handsome, appearance, the work oxen being wonderful specimens of strength and docility. It is only in the province of Buenos Ayres that any particular attempts have been made to improve the breed.

The last census (1881) classifies the stock of the province as follows:

Class.	Number in the province.	Value.
Native cattle	4,037,084	$38,756,006
English and other blood animals	22,219	4,443,800
Mixed breeds (English and native)	886,059	7,721,180
Work oxen	88,008	2,816,256
Milch cows	221,440	6,200,000
Total	4,754,810	59,037,242

MILCH COWS AND BUTTER-MAKING IN THE ARGENTINE REPUBLIC.

The small number of milch cows in the province of Buenos Ayres compared with the total number of cattle will attract attention, while in the other provinces, could the figures be obtained, the discrepancy would be still greater; whereas in the United States over one-third of all the horned cattle of the country are cows kept for dairy purposes. This shows the meager proportions which the latter industry has yet

assumed in the Argentine Republic. Indeed, in the census of this province, which has just been published, the figures are so insignificant that no returns whatever are given of the amount of the milk, butter, and cheese produced. Cows are never milked without the presence of the calf to start the milk; and even then the cows are so unaccustomed to the operation that they have frequently to be kept lassoed to a stake. In this city milk is either delivered at the door by milkmen (*lecheros*) who come in from the country on horseback bringing the fluid in tin cans balanced on each side of a pack-saddle; or, what is perhaps more usual, the cows with their calves tied to their tails, are driven through the streets morning and evening, and the quantity which each customer desires is milked at his door. The appearance of these droves of cows on the streets with their calves pulled along behind them is quite ludicrous to foreigners, and illustrates the primitive condition of the dairy industry in this country. Milk sells in this city for 8 cents a pint, and butter for 40 to 60 cents per pound.

I will not assume to say that Yankee churns are unknown in this country, but a good portion of the butter which finds its way to the city is churned by the *lecheros* on horseback, on their journey to town, by the mere jolting of some cream in the tin cans strapped across the horse's back. But the most novel mode of making butter in the interior is to fill a bag made of hide with sour cream, then fasten the bag to one end of a long hide rope and attach the other to the leather girth around a horse's body, which is then mounted by a *gaucho* and ridden at a break-neck pace over the pampa for a sufficient length of time to secure the making of the butter by bumping the milk-bag against the ground. I doubt if a patent-right for this invention would sell in the United States.

PRICES OF CATTLE IN THE ARGENTINE REPUBLIC.

In regard to the prices of native animals, there are considerable fluctuations corresponding to the season. Cattle that have been safely wintered and have just entered upon the spring grasses, command better figures than cattle that are in bad condition after a long drought with the winter before them. Likewise for animals raised for slaughter there is considerable difference in the prices according to the locality. In the upper provinces, far removed from market, the price seldom exceeds $10 to $15 for steers; $15 to $18 for fat bullocks; milch cows, $10 to $15 with calf; without calf, $8 to 10. In this city for the most part *novillos* of two years sell for $10 to $15; of three years, $15 to $20; fat bullocks, for $30 to $40; cows with calves, from $12 to $60; work oxen, $25 to $40. For the great slaughtering and curing establishments (*saladeros*) the cattle are bought at the *estancios* in droves at so much a head, generally from $6 to $12 "*al corte*,"* while for breeding purposes the price is still less when sold in large numbers, say from $5 to $8 per head all round.

**Al corte* means "at the cut off," and is an expression which owes its existence to the old custom, at the time of the purchase, of separating a part of the herd containing the old and the young at a hazard as to the number of head, and the purchaser is obliged to take the quantity of cattle "cut-off," at the price per head fixed before hand, whether the animal be old or young, diseased or healthy. At present it is more usual to put the animals into the corral, where the gate is opened only wide enough to allow the escape of one at a time. The animals are thus counted, as they pass through, by the parties interested; and the number being filled, the gate is closed.

CAPITAL REQUIRED TO START AN ESTANCIA IN THE ARGENTINE REPUBLIC.

The outlay necessary for starting a cattle *estancia* depends upon its location, and its annual product depends very much upon fortuitous circumstances. In regard to the first point, of course the capital required will be greater in the province of Buenos Ayres than on the frontiers, west and south, or in the interior provinces, for the reason that the former lands, command higher prices, the prices decreasing as the distance from Buenos Ayres increases. In regard to the second point, it must be borne in mind that protracted droughts (*secos*) are not unusual in this country, during which thousands upon thousands of stock die from thirst and starvation, while the severe rain and snow storms of winter, frequently carry off other thousands upon thousands of unprotected cattle. For these two reasons any estimates on these subjects cannot be implicitly relied upon. Mr. Ricardo Nap, a well-known statistician of this city, has presented some figures, which for a good year I suppose may be taken as approximately accurate. He assumes that a league square of pasture-land, with the necessary buildings included, has been purchased in the province of Buenos Ayres for $40,000 (a similar quality of land farther out can be purchased for $20,000 to $30,000 per league, while on the frontiers it can be obtained for $4,000 to $10,000 per league). He then assumes that it is stocked with both cattle and sheep as follows:

10,000 sheep, *al corte*, at $1.10	$11,000
1,000 horned cattle, *al corte*, at $6	6,000
300 mares, at $4	1,200
50 saddle horses for use, at $16	800
Outlay in the purchase of cattle	19,000

The capital fund for land and cattle will then be $59,000, gold; and he calculates the annual product as follows:

2,500 sheep, sold to tallow establishments, at $2		$5,000
1,000 sheep, *al corte*, at $1.20		1,200
150 horned cattle for the butcher, at $14		2,100
100, *al corte*, at $6		600
25 mares sold, at $4		100
Augmentation and product of the year		9,000
Also 400 quintals of wool, at $12	$4,800	
Also 3 quintals of hair, at $20	60	
		4,860
Gross proceeds		13,860

He deducts expenses as follows:

Salary of the manager, per annum	$240	
Salary of two servants, per annum	280	
Salary of six shepherds and peons, per annum	1,080	
Sundry expenses	26	
		1,860
Which, according to his figures, leaves a net gain of		12,000

This is nearly 21 per cent. on the amount of the investment, and he gives this as the lowest estimate; but, taking the years as they run, with the losses which almost inevitably occur from the causes I have mentioned, and I doubt if the profit would exceed 12 to 15 per cent. on the investment when the balance-sheet is fully made up. In good years, and these do sometimes occur, the profit may even go to 30 per cent., but this is not likely to happen very often.

It will be observed that there is no item in the above expense account for food. This is because the animals on the place furnish the aliment, which is almost exclusively meat, while the skins, hides, tallow, an suet of the animals butchered for consumption pays nearly it not all the small expenses; and, as Mr. Nap says, "it is exactly in the absence of small expenses that the principal gains of the pastoral industry are found in the Argentine Republic," no other provision whatever, save what the pampas furnish, being required or at least ever made use of for the maintenance of the animals when the pasturage gives out.

The above estimate is made on the basis that the estancia is partially stocked with sheep—and I am informed that such estancias are really the most profitable—but many of those more remote from this city are exclusively devoted to horned cattle. Three thousand horned cattle being the number usually allowed to a league of land, it is easy to change the calculations in the estimate to correspond to that basis.

Whatever may be the actual per cent. of profit which is realized from cattle farming, it is yet certain that the business is lucrative, since those who are engaged in this branch of industry have became the rich men of the country, many of them having amassed immense fortunes. It is true, however, that the increase in the value of their lands has in some cases had more to do with their wealth than the product of the pasturage. I know many cases where the value of well-situated estancias has doubled in the course of a few years, to say nothing whatever of the product.

FUTURE OF THE CATTLE INDUSTRY OF THE ARGENTINE REPUBLIC.

I have undertaken in the foregoing pages to furnish the Department with an exhibit drawn from the most reliable sources at my command of this leading industry of the Argentine Republic, its history, its wonderful development, its details, its products, and its profits. What I have accomplished is perhaps hardly what might have been expected in reply to the circular which was sent to me; but a strict compliance therewith was impossible, from the fact that there are no horned cattle in this country whose importation would be an improvement to our existing breeds and to productions of the dairy. At the same time, however, it has seemed to me that the manner in which the great cattle estancias of the river a Plate are managed and made productive was matter of sufficient interest, not merely to our cattle-breeders but to our people generally, to warrant the extended mention I have made of them, even though they offer but few points which it would be worth while for us to imitate.

In my opinion, however, the cattle industry of this country, if not in its infancy, is still in its undeveloped state, and that it will hereafter assume far greater proportions and be prosecuted with far better results than it has yet done. In the past cattle were only raised in this country for their hides; at present they are raised for their hides and the product of their carcasses. The time is coming, with the influx of intelligent labor from Europe, when to these the products of the dairy will also be added. To this end it is necessary that an improved breed, perhaps the cross of the Hereford with the native cow, shall take the place of the native (*creole*) cattle, which at present constitute the stock of the country. This change is now gradually going on, and a few more years will shown a vast difference in the qualities of the breed, while the production of milk, butter, and cheese will double, if not treble, the present

value of the industry. I should not, indeed, be surprised if the Argentine Republic should yet share with the United States the business of supplying the Old World not only with its principal aliment, meat, at a moderate price, but likewise with all the products of the dairy.

The introduction of blooded cattle and their crosses with the native will of course require that they should also receive greater care; but, when there has been established a more intimate connection between husbandry and the breeding of cattle, this also will come. Alfalfa and other succulent grasses will be grown and harvested to secure them from possible starvation during the winter months; while sheds or great belts of timber will be planted to protect them from destroying storms. The country, all these years, has gone on the idea that the industry needed no other care than the gathering of its produce; and that, as the millions of cattle, which fed on the spontaneous grasses of the pampas, increased and multiplied without any attention from the proprietors, there was nothing more to be desired. It is these natural advantages which have in great part caused the negligence which has attended this industry. Everything has been left to nature, without reflecting that it is very necessary to assist it, and in some cases even direct it, in order to have it yield its best results. But the old ways of the cattle-growers will give place to the improved methods of other countries; the advantages which the Argentine Republic offers for the raising of cattle on the largest scale will be supplemented by their scientific appreciation and utilization, and the industry will take a new departure of increased production and of increased wealth to the nation.

E. L. BAKER,
Consul.

UNITED STATES CONSULATE,
Buenos Ayres, November 24, 1883.

URUGUAY.

CATTLE AND CATTLE-BREEDING IN URUGUAY.

EXTRACTS FROM A REPORT (PUBLISHED IN CONSULAR REPORT No. 73, FOR FEBRUARY, 1887), BY MR. JOHN E. BACON, CHARGÉ D'AFFAIRES AT MONTEVIDEO.

CLIMATE.

The climate is by no means tropical, but temperate, somewhat similar to that of the Chestnut range of Upper Italy.

The thermometer (Fahrenheit's) scarcely ever marks 95 degrees in the summer, the general mean being about 65, and should the degree of 90 remain for two days it invariably gives rise to a thunder-storm, which cools and freshens the air in the most astonishing manner. The winters are mild, and though frosts are frequent in June and July, they do not affect the vegetation to any extent. The air is unusually pure, the atmosphere even in Montevideo, notwithstanding the location of the city immediately on the sea and river, quite dry. Indeed, the whole Republic enjoys an enviable reputation for salubrity.

VALUE OF LANDS AND STOCK.

The aggregate value of real estate and stock was estimated officially in 1883 at $237,496,092, and is now supposed to be at least a fourth more, $296,870,115. To this should be added about $125,000,000 invested in other property, making in all $421,870,115.

The proprietors of the lands and stock are reckoned at 41,760, and it will be a little strange to know that more than one-half of this property is owned by foreigners, as will appear from the following table copied from the *Estadística-General* for 1885:

Nationality of proprietors.	Department of Montevideo.		Other departments.		Total.	
	Proprietors.	Value of property.	Proprietors.	Value of property.	Proprietors.	Value of property.
Uruguayans	3,568	$34,717,508	14,669	$686,940 16	18,237	$103,411,522
Italians	3,633	15,861,440	2,849	6,928,622 00	6,482	22,790,062
Spaniards	1,995	10,501,077	4,643	17,327,866 00	6,638	27,829,843
French	1,072	7,371,070	1,523	6,095,691 00	2,595	13,466,761
English	134	1,093,504	379	6,549,050 00	513	8,542,563
Germans	83	800,120	244	1,790,545 00	237	2,590,665
Portuguese	77	667,662	229	1,255,270 00	306	1,922,932
Argentines	144	1,877,230	1,599	2,229,749 00	743	4,106,979
Brazilians	43	543,233	5,543	50,998,311 00	5,586	51,541,544
Saizos	40	194,792	205	434,463 00	245	629,255
Americans	10	51,140	16	96,837 00	26	147,977
Belgians	3	23,800	7	51,412 00	10	75,212
Africans	5	3,600	.....	.....	5	3,600
Danes	1	39,890	.....	.....	1	39,890
Austrians	8	37,870	6	19,749 00	14	57,619
Greeks	2	2,000	.....	.....	2	2,000
Swedo-Norwegians	2	4,422	5	10,788 00	7	15,210
Chilians	.....	.....	11	126,182 00	11	126,182
Paraguayans	.....	.....	10	14,261 00	10	14,261
Dutch	.....	.....	2	15,450 00	2	15,450
All other	.....	.....	.....	165,505 00	.....	165,505
Total	10,820	74,691,318	30,940	162,804,774 00	41,760	237,496,092

RÉSUMÉ.

Nationality of proprietors.	Department of Montevideo.		Other departments.		Total.	
	Proprietors.	Value of property.	Proprietors.	Value of property.	Proprietors.	Value of property.
Nacionales (nationalists)	$3,568	34,717,508	14,669	$68,694,014 00	18,237	$103,411,522
Estrangeros (foreigners)	7,252	39,973,810	16,271	94,110,760 00	23,523	134,084,570
Total	10,820	74,691,318	30,940	162,804,774 60	41,760	237,496,029

In proportion to the population the number of live stock is enormous. According to the tax returns for 1883 there were in the Republic the following: Horned cattle, 5,967,634; oxen, 92,767.

SLAUGHTER OF CATTLE AND EXPORT OF BEEF.

The inquiry very naturally suggests itself, What becomes of the increase of such immense herds and flocks of cattle and sheep (8,000,000 cattle, 20,000,000 sheep) in a country containing only 700,000 inhabitants?

The greater part of it is thus accounted for:

Of horned cattle (home meat supply), in which is included the beef furnished to the respective naval squadrons in Montevidean waters..head..	502,000
Live cattle exported per annum	102,000
Killed in *saladeros* (slaughter-houses) per annum	704,000
Total	1,308,000

The exportation in 1883 showed as follows:

Jerked beef or dried meat	pounds..	76,706,770
Pressed meat	do....	3,326,751
Extract of meat	do....	1,099,630
Grease	do....	37,601,739
Tallow-skins	do....	11,547,590
Artificial guano (refuse meat, bones, &c.)	do....	9,000,000
Hair	do....	3,250,102
Cow-hides	number..	1,638,730
Living sheep	do....	142,000

These *saladeros* (literally, salting places) are peculiar to the river Plate, especially to Uruguay and the Argentine Republic. In the vicinity of Montevideo there are nine saladeros, the principal one being that at the "Cerro" (little mount), across the bay from the city, where, according to Mulhall, 200,000 head of cattle are killed annually, and he states that "when the wind comes from that quarter the smell in Montevideo is disagreeable." I must say that I have not as yet experienced this disagreeable smell, nor can I find any one who has.

On the river Uruguay there are a dozen or more of these saladeros, including the famous Liebig Extract of Meat Company. There are from 600,000 to 700,000 head of cattle slaughtered at these saladeros every season, besides a vast number of sheep, and from 50,000 to 80,000 mares. "The hides, tallow, grease, and other products of these establishments," says a recent writer, "involve the turning over annually of £2,500,000 to £3,000,000."

The same author (anonymous, but whose book is issued by the authority of the consulate-general of Uruguay, London, 1883) estimates the "commercial value of an ox, young and in good condition," as follows:

Hide, 68 pounds, at 71 reals per 75 pounds	$6 43
Tallow, 40 pounds, at 13 reals per 25 pounds	2 04
Meat, 150 pounds, at 55 reals per quintal of 100 pounds	9 90
Remnants	50
Total	18 87

The saladero expenses for each animal are about $3.60.

THE LIEBIG EXTRACT OF BEEF FACTORY.

The "Liebig Extract of Beef" has now a world-wide reputation; indeed, I believe that it has become the universal prescription for debility and prostration. The factory is located in this Republic, at Fray Bentos, in the department of Rio Negro, on the river Uruguay. It employs over 500 men, and loads at its own wharves upwards of 80 vessels during the year for the export of the produce to Europe. As this factory and its extract have become so famous, they merit more than a passing notice. Indeed, it must be a matter of interest and curiosity to the thousands of invalids who daily consume the Liebig extract to know how it is made.

The best description given of it is by Mr. Rathbone, in his report to the Orange Estancia Company, Liverpool, from which we will make such extracts as our limited space will allow:

The cattle are, on arrival, driven into large corrals or paddocks, arranged so as to supply them with water, but no food is given to them. A long, narrow passage, about 6 or 7 feet wide, and skirted by a long, narrow platform pathway, about the height of the animal's horns, leads down to a small paddock, with a similar pathway around and a bridge over the opening into the galpon, which is further closed by a movable beam. Below the bridge is a large, low, square iron truck on a tramway which runs into the galpon, and branches into two parallel lines, so that the two trucks may pass each other. Along the left side of the shed are long ranges of rails for hanging meat; and along the right hand, a flat, slightly shelving, flagged space for laying the oxen upon. At the end of the shed is a large brine bath for soaking the skins, and beyond this there are further sheds where the skins are piled up with salt previous to being shipped. In saladeros the skins are generally salted, but on estancias the hides are usually dried. As I arrived, about fifty oxen were being hunted down the "race" or paddock into the fatal paddock.

* * * * * * *

When the paddock was full and the gate shut, a man with a lasso, of which one end was attached to a steam winch outside (natives call it the English horse), went round the pathway and threw the noose over the most prominent horns he could see, which were by no means ordinarily the nearest to the bridge. The winch being set going, the beast was hauled, stumbling and slipping and pushing aside all animals in its way, till its head was chocked up against the other beam leading into the galpon, upon which stood the killer, who, with a stab close behind the head with a large dagger-bladed knife, cut the spinal cord, and the animal at once dropped with a heavy thud, but without a struggle, onto the iron truck; the lower beam was then rapidly withdrawn, the lasso disengaged, and the truck run into the galpon by the men. Here, by means of a lasso attached to a horse, the animal was hitched into its place at the side of the shed, where a skinner was waiting for it, who immediately cut its throat and began to skin it. The blood was caught in large scoops and ladled into casks placed for the purpose. Meanwhile the skinner rapidly took the skin off, and, though sensation was probably thoroughly destroyed by severance of the spinal cord, yet muscular action was not, and it was rather ghastly to see the struggles of an animal with half its skin off, and even to detect a sound painfully like a bellow. These movements seem to take place when certain nerves were touched about the neck, and thus set in action. The skin off, it was taken to the brine bath spoken of, the entrails were taken out and carried away, the ribs cleared of flesh, and the limbs cut off and

taken to the opposite side of the galpon, and there all the meat was cut from the bones and hung up on the rails provided for that purpose, together with that cut off the ribs, &c., still warm and quivering with life. The skull and horns were taken in a different direction. This operation takes from eight to nine minutes on an average, but on occasions has been done in five, and the skinner waits his next turn, which comes every fifteen minutes. As the truck is run out, the alternative truck is run into the paddock and the beam shot back for another victim.

The shed contains about 25 oxen at a time, so that about 100 are killed, skinned, and cut up in an hour, and in the height of the killing season as many as 1,200 are thus disposed of per diem, or from 100,000 to 150,000 a season. Each skinner gets 6 pence per head, but if in skinning he makes a hole in the skin he loses his payment. In the height of the season he disposes of about 33 in a day.

* * * * * * *

After 150 were disposed of, in an hour and a half, the remainder were left till after breakfast, and the place was cleaned up in a marvelously short time, making it difficult to believe that such a scene of blood had been taking place so recently. * * * When it has cooled, the meat is cleared of fat and is stewed in large oblong caldrons, in which the water is kept somewhat below boiling point, as it is a peculiarity of the extract that it contains no matter which is not soluble in cold as distinguished from boiling water. The thin soup so obtained is then strained off and carefully skimmed, which removes any trace of grease that may have remained in the meat. It is then passed through a series of elaborate evaporators, out of each of which it comes thicker until it reaches a consistency rather more solid than treacle. As much as 90,000 gallons of water a day is sometimes thus evaporated. It is now ready for use and is packed in large cube tins holding about 110 pounds of the extract; each of these tins contains on an average the substance of 15 animals, and is worth about £50.

Tin shops, carpenter shops, engineers' rooms, &c., on a complete scale are attached to the factory. There are also churches, schools, and houses for the operatives.

I will simply add that a higher price is asked here for the extract than in the United States, and that, strange to say, what is termed the "English Extract" is cheaper than either the Uruguayan or American. The solution of this, I am advised, is found in the fact that the Uruguayan is unadulterated, and the English and American, after being shipped from here, is returned adulterated, or rather weakened, so as to undersell the former. Whether this be so or not I cannot say, but I do know that the English brand is cheaper in this market than the Uruguayan, or, at least, that I paid higher for the latter.

FROZEN-MEAT TRADE.

The principal wealth of the Plate countries consists in herds and flocks, and so rich are they in these that every possible attention and effort have been given to solve the vexed problem, "What shall we do with our surplus beef and mutton?"

Experience has taught the farmers that the shipping of live stock will not pay; the voyage being too long, say from 20 to 30 days by steamer to France, England, Germany, and Italy, and as a consequence the freights, including the feed, are very high.

For some time jerked beef answered for the purpose, but by degrees the frozen-meat trade has been resorted to and made successful.

In the Argentine Confederation alone there are said to be now 100,000,000 sheep, besides immense herds of cattle, and, as the pastures are apparently inexhaustible, the increase of such immense herds and flocks must be prodigious and beyond all conceivable use for a population of only 3,000,000.

In Uruguay, likewise, with a population of about 700,000, there are said to be now (1886) over 8,000,000 cattle and 20,000,000 sheep.

It will therefore be easily seen that this frozen-meat trade, if ultimately successful, will assume gigantic dimensions. The question has

become so important that legislation for its encouragement and development has been resorted to, and a certain interest guaranteed by Government upon all capital invested in factories of frozen carcasses.

For instance, in this Republic, Uruguay, it has been lately enacted, in order to assist the development of the export of meat, that the state will guarantee an annual interest of 6 per cent. upon all companies that shall establish themselves within the Republic for the purpose of exporting fresh meat, with a capital of not less than $500,000, to be increased to 7 per cent. when the capital is not less than $3,000,000, the total capital to be thus guaranteed, however, not to exceed $6,000,000.

This guarantee is subject to the following conditions:

(4) No guarantee to be granted until the proposer shall have deposited in one of the banks of the capital a sum equal to 1 per cent. of the amount of capital upon which the guarantee is asked. This deposit may be made in coin, or in Uruguayan bonds at the market value, or in real estate. In this last case the owner still to receive the revenue derived from such property.

(5) So soon as the company satisfies the Government that work has been done in the country equivalent to the amount of deposit, such deposit to be returned. In the event of the enterprise not being carried out within the legal period stipulated, the deposit shall be forfeited to the state, in accordance with article 14.

(6) Before any payment can be made on behalf of guarantee, the companies must satisfy the Government that they have complied with the following conditions:

(*a*) That they have employed in the country in constructive works, on land and afloat, a capital of not less than $100,000, if acting under article 1, or of $500,000, if acting under article 2.

(*b*) That the annual export has actually amounted to a minimum of 15,000 head of cattle or 120,000 sheep for each $500,000 of capital.

(7) The guarantee to be granted upon the capital actually raised for these enterprises, including that employed in the construction of establishments in the country and also the working capital in circulation.

(8) This guarantee to be granted only once, and in no case will the duration of the guarantee exceed ten years.

(9) When the companies earn more than 10 per cent. per annum they will be liable to refund to the Government the excess until they shall have repaid any sums received to make up the guaranteed interest.

(10) The executive power is authorized to sanction the operations of the companies in such localities as they may select for the establishment of freezing depots, when these do not act to the prejudice of other interests, and conform to the law of the Republic.

(11) The steamers of the companies will enjoy packet privileges.

(12) Companies will be at liberty to give up the guarantee at any time, provided they repay to the state all sums received as guaranteed interest. When this is done, the official inspection of their operations will cease, but all their other privileges will continue as before.

(13) In case the state be called upon to make up the interest to the guaranteed rate, the executive power is authorized by this law to take the sum required out of the general revenue of the country, and in case of there not being sufficient funds, it will at once propose to the legislative body to grant the sum necessary for payment.

(14) The executive power is hereby authorized to concede at once guarantees to the company or companies which, in its judgment, are prepared to fulfill the conditions laid down in this law, but cannot allow more than two years for the installation of the works. In the event

of the company failing to be in working order within that period, the deposit required by Article 4 will be forfeited to the state, and the concession considered as canceled.

(15) The executive power will make arrangements for the inspection of the companies' operations, and take the necessary steps to secure the compliance with this law.

In addition to this, the subject receives the greatest attention from the rural societies, agricultural clubs, &c.

Indeed the interest manifested in regard to this trade by the valley of the Plate (chiefly Uruguay and the Argentine Republic) is ably supplemented by capitalists in England, France, Germany, and Italy; especially by the owners of the many steamboat lines between those countries and the River Plate Republic, as its success would fill their steamers to repletion with freights.

The Zenoha, for instance, lately carried, at one time, 13,536 carcasses of frozen sheep and 335 quarters of beef, at 3¾ to 4½ pence per pound for the mutton, and 2½ to 5 pence for the beef.

In addition to other meetings in different parts of Europe for encouraging this trade, the papers allude to one lately held at Hamburg, convened by Herr Pedro Beck, at which the matter was thoroughly discussed and a proposition made for an investment of 3,000,000 marks to assist the trade between that port and the river Plate.

The great struggle now, as to what country shall monopolize this frozen-meat trade, seems to lie between the United States, Australia, New Zealand, the Argentine Republic, and Uruguay.

The transportation of frozen meat has become an undoubted success, and sooner or later, in the opinion of the best-informed parties, will entirely supersede that of the transportation of live stock.

If this be true, the subject becomes of vast importance to the United States, and especially to Chicago, the principal shipping point to England. My attention of late has been forcibly directed to this point by reading in the papers here of meetings, where this matter, so far as it affected the United States and Chicago, was thoroughly discussed. In point of fact, not only the Governments here (as will be seen from the guarantees by Uruguay of 6 or 7 per cent. to frozen-meat investments above referred to), but wealthy capitalists, backed by the wealth and intelligence of the *estancieros* (large farmers), are apparently more interested at present in devising ways and means to wrest this trade from the United States, Australia, and New Zealand than in any other. In order to do this, they have procured the fullest and most minute information as to the amount of live stock and frozen meat sent from those countries, where it is sent to, at what prices, freights, &c. For instance, I read not long since of a meeting where it was stated, upon the authority of the Times, that the freights from the ranches in the United States, to Chicago, would average 32 shillings per head; from Chicago to New York, a sovereign; and the cost for shipping a carcass or live beast onward to Liverpool is about 50 shillings; that a beast on the plains is worth, roughly, £4, and that, therefore, American fat cattle, dead or alive, would cost in England little less than £10 apiece, and showing by an accurate calculation that the same beast or carcass could be laid down in England for half that price.

An article from the New York Daily Commercial Bulletin was also commented upon, stating, among other things, that a large amount of jerked beef was annually exported by Argentine and Uruguay, the importations to Brazil and Cuba alone amounting last year, respectively, to these countries, to $1,700,000 and $1,143,000; that no attempt

had been made in the United States to compete with Argentine and Uruguay, the only exporters of jerked beef, and it would doubtless be difficult to do so, as the cost of the cattle is much greater in this country. Their transportation facilities to the West Indies are better than ours, notwithstanding the difference in the distance, and a steamer leaves Buenos Ayres for the Brazilian ports every day.

The jerked-beef trade is likewise demanding constant attention. Indeed, there is a society in Montevideo, supported mainly by the Government, with the view of opening new markets for the sale of this product. It is said that a great effort will be made by this society to provide ways and means for substituting in the foreign markets jerked beef for codfish from Sweden and Norway. They claim that the jerked beef is much cheaper and much more nutritious than the codfish, and that no other meat is so healthy; that it can be laid down, free from bone and moisture, in Europe at 5 cents per pound, about one-fourth less than the cost of the codfish; indeed, they go so far as to say that the nutritive value of jerked beef, pound for pound, is greater than that of fresh meat.

About a year ago the Buenos Ayres Standard (owned by the famous statistician Mulhall) contended that, allowing 1½ pence per pound and 1½ for freight, Merino mutton could be placed on the London wharves at 3 pence per pound. A New Zealand correspondent, noticing this, asserts that it cannot be done for less than 3½ pence per pound, but after commenting upon the importation of mutton from Australia, New Zealand, and the Plate, he admits that, "in Merino and the lower grades of mutton, it is only a matter of time for the Plate to smother our Australian neighbors, and drive them out of the English market by advantages which the former possess of a slightly lower cost of production and a much lower freight to England."

A sufficiency of transportation is also being provided. In connection with this it is stated, by way of example, that Montevideo is in daily communication with England by telegraph, and almost so by steam, no less than 217 steamers having left England for Uruguay in 1884, besides 198 sailing vessels; making a total of 415, or considerably more than one per diem.

The question, therefore, of freight for the exportation of jerked beef in the returning vessels presents no difficulty. When to this is added that the French and Italian lines are daily going and coming between Montevideo and their respective ports, to say nothing of the sailing vessels of the different nationalities, it will be seen that the country will not suffer for want of freight. Indeed, I am told that the rivalry between the respective lines and boats is so great as to render freights comparatively cheap.

I have bestowed much time and consideration upon this subject. It is of vital importance to the United States, so far as the transportation of frozen beef is concerned, and it is highly important that it should be known that the wealthy, astute, and energetic capitalists of the Plate countries, backed by the money from England, France, Italy, and Germany, are endeavoring, not only to compete with the trade of the United States in this regard, but to rival and finally supersede it.

The Republics of Argentina and Uruguay and Paraguay alone possess over 37,000,000 head of cattle and sheep. Indeed, in a comparison contained in one of the leading journals here, it is stated that there are over 1,500 cattle to every hundred inhabitants of the Plate country, and only a little over 70 cattle to the hundred in the United States. This may be, and I dare say is, exaggerated, though Mr. Curtis, if I

am not mistaken, makes the difference still greater. The truth is, the statistics here are generally unreliable. At least I am so advised. The comparison, however, even dropping one-half of the 1,500, is astounding.

Besides this, there is no doubt of the great excellence of the pastures here, and of the succulence of the natural grasses and of their comparative inexhaustibility, nor can there be any doubt of the cheapness of beef, the tenderloin steaks selling in Montevidean markets at 6 cents per pound, and still less doubt that there will always be a sufficiency of transportation for all purposes.

In this connection I will state that the merchants, shippers, and capitalists of this city (Montevideo), composed, as they are, of all of the great nationalities—English, French, Spanish, German, and Italian—are unusually shrewd, intelligent, and experienced, and for any feasible plan can command, either themselves or through their European acquaintances and houses, any reasonable amount of capital. Indeed, owing to the low interest paid on money in Europe, generally millions upon millions, as the journals here state, are seeking investment at higher rates in the countries of the Plate.

As above stated, my attention was first directed to this subject by reading in the papers of the minutiæ of the Chicago meat trade, how to compete with it, &c.

I will only add, in this regard, that there is now a petition before the Buenos Ayres legislature for aid in the transportation of frozen meat.

BRAZIL.

CATTLE IN BRAZIL.

REPORT BY CONSUL-GENERAL ANDREWS, OF RIO DE JANEIRO.

DIFFICULTY OF OBTAINING CATTLE STATISTICS IN BRAZIL.

I have for a long time had in mind the Department's circular of 18th July last in respect to breeding cattle, but owing to the difficulty of obtaining information here on such a subject, I have been delayed in giving a reply.

The so-called "department of agriculture, commerce, and public works of Brazil" is occupied principally with public works, and does not collect or publish statistics upon agriculture. Nor does there appear to be any society or organization which collects statistics on the subject in question. There has been published in this country for many years an Agricultural Review in the Portuguese language and I have carefully looked through all its back volumes, at the national library, with the hope that I could find some information in regard to breeding cattle. I found many articles on the subject, but they all related to English or other foreign stock. Not a particle of information could I find in respect to the cattle of Brazil.

I have had to resort, therefore, for the facts contained in this report wholly to personal inquiry.

BRAZILIAN CATTLE AND THE HOME MARKET.

A rough estimate puts the number of horned cattle in Brazil at 20,000,000 head.

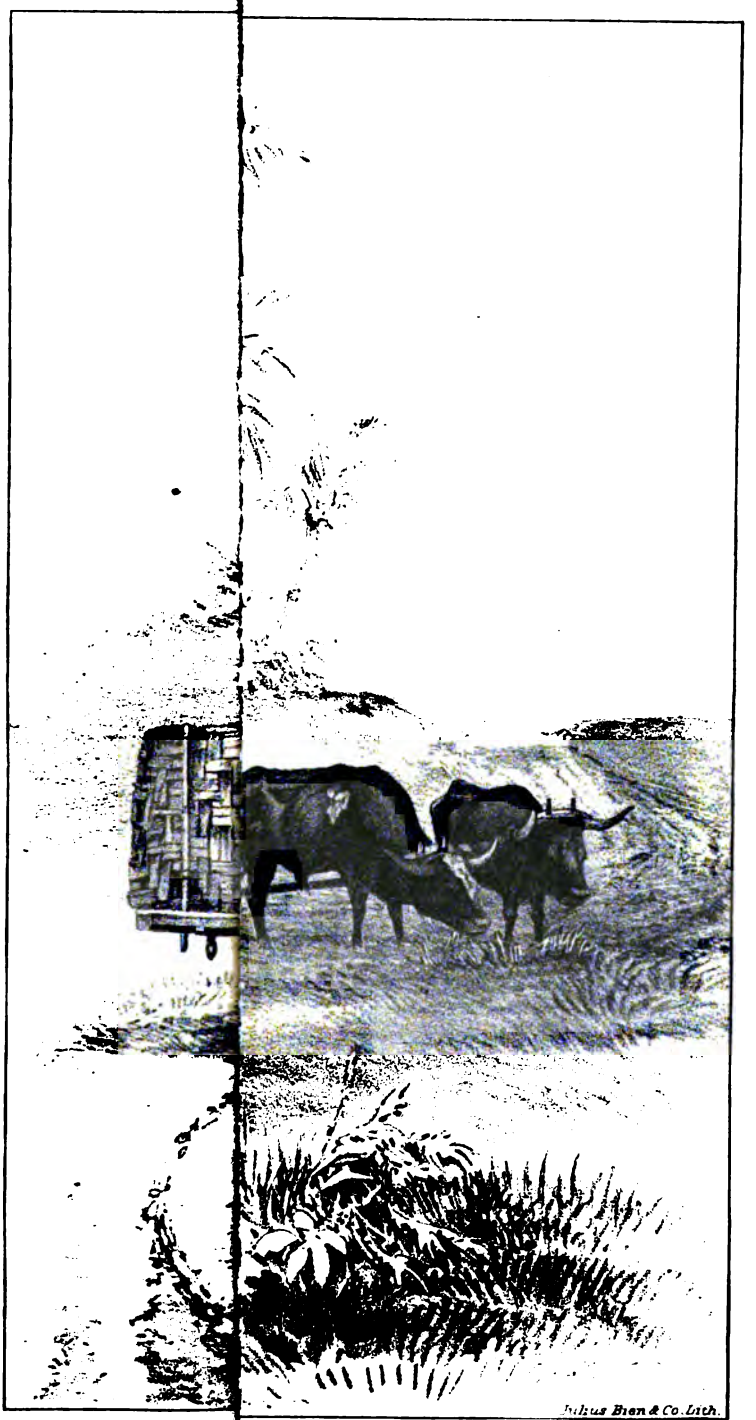
Of course there are many and extensive areas in the interior with an altitude of 2,000 feet above the sea, well adapted for raising, and which now produce cattle; yet owing to their remoteness they are not available for supplying some of the best markets with beef. It is a striking fact that this city should have imported last year 54,000,000 pounds of dried beef from Uruguay and the Argentine Republic.

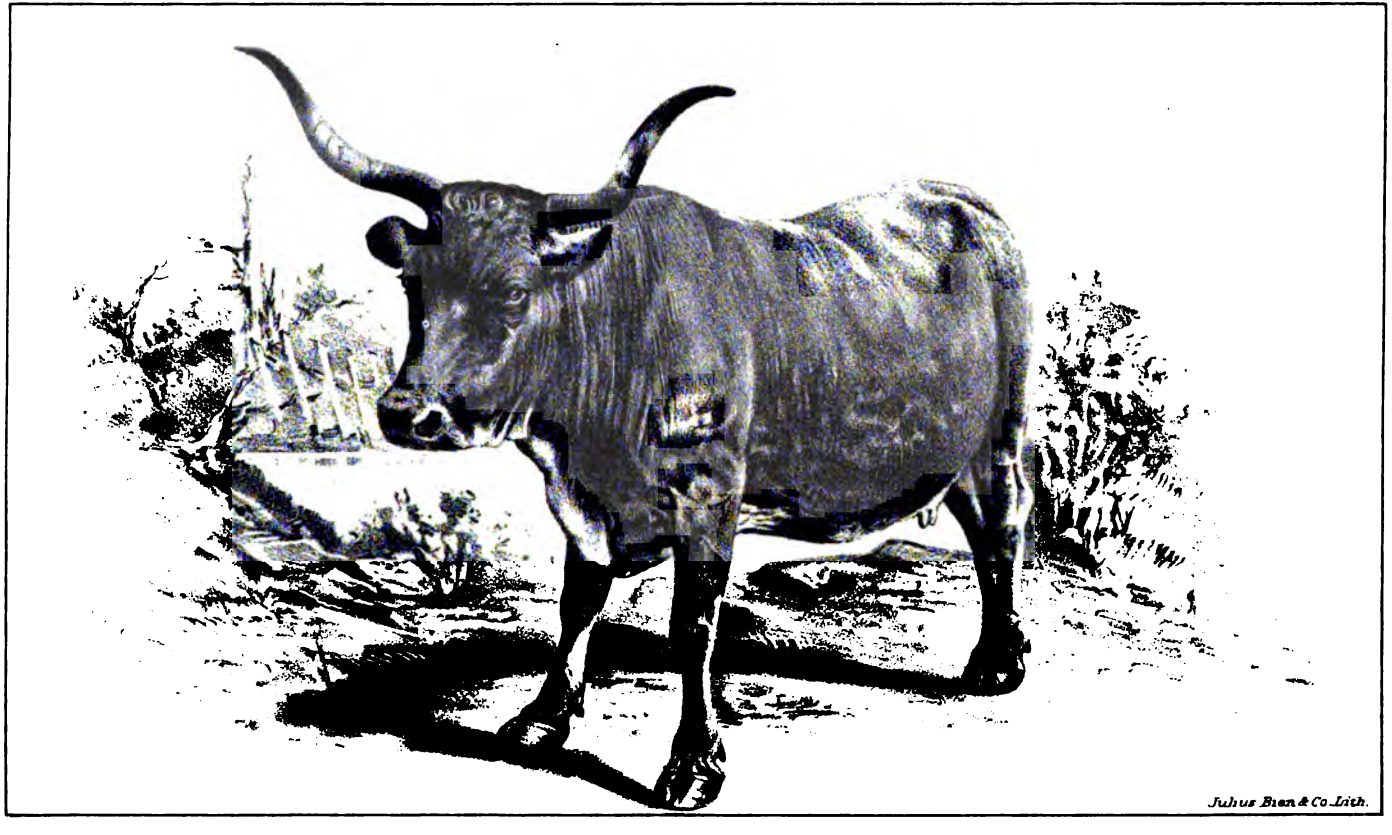
THE OLD NATIVE BRAZILIAN CATTLE.

The old native race of Brazilian cattle has long horns and a yellow-brown color. Having been introduced from Spain and Portugal over two centuries ago they have the same origin probably as those now found in California, New Mexico, and Texas, and are better adapted for producing oxen and beef than for dairy purposes.

The oxen of this breed are very large, being much larger, I should say, than are usually seen in the United States or in the north of Europe.

The accompanying photograph, taken in the interior of this province, of a team of four yoke of oxen, shows the native oxen of Brazil of medium size, but perhaps of less than usual flesh. The cart which they are drawing represents the kind in common use, having solid wooden


Julius Bien & Co. Lith.



BRAZILIAN COW OF THE OLD NATIVE BREED

wheels and axle which turns with the wheels, producing a sound similar to the filing of a large saw.

During a recent tour which I made in the extensive agricultural province of San Paulo I saw some good specimens of the native cattle. A peculiarity of many of the cows is their resemblance to oxen in respect to head and neck, and not unfrequently in size. If there is any trait or quality of the Brazilian breed which could be profitably introduced into the United States it must be that, and I think only that, of size.

The accompanying is a photograph which I had taken of one of these cows at Piracicaba, a town 500 miles distant from here.

The local name of the breed of this cow is Caraqua, and her measurement is as follows: Height, 4 feet 8 inches; length of body, 8 feet 2 inches; distance between tips of horns, 4 feet 7 inches; age, nine to ten years; estimated weight, 900 pounds.

The name of the owner of the cow is Mr. Bento Vollet, and of the photographer, Mr. Bernardo Newman. I saw cows of this breed which yielded about 12 quarts of milk per day.

MIXED BREEDS IN BRAZIL.

The Mesticos.—This long-horned breed is docile and is esteemed principally for draft. Mixed with breeds from Europe it has produced a stock called "Mesticos," which are large and good looking with smaller horns and yielding meat lightly, but of good flavor.

The Quiabanos.—The interior province of Malto Grosso produces a small bullock known as the "Quiabanos" breed (a name derived from the capital of the province), of rather wild inclination but affording good meat.

English breeds.—Of course in the principal cities and towns some of the best English breeds, such as the Shorthorns and Jerseys, have been introduced for family use.

The Turino.—The breed used almost exclusively for milk dairies in this and other large cities is called the "Turino." It is rather a large black and white cow with medium-sized horns, similar to those seen in the dairies of France and Switzerland, and yields milk abundantly, say 1,200 pounds per year.

BEEF AND DAIRY PRODUCT CONSUMPTION IN RIO DE JANEIRO.

The fact that most of the butter used in a city like this is the modern adulteration, imported in tin cans, is one of many proofs that might be adduced of the backward condition of the dairy industry in this country.

The city of Rio de Janeiro consumes in beef, on an average, 110,000 bullocks a year. These are principally killed in the public slaughter-house, at Santa Cruz, 9 miles distant on the railway, and the meat brought into the city in cars. From the station it is distributed towards evening in heavy four-mule carriages, which can be distinguished from all others by their rapid pace and heavy rumbling, to the retail shops, which latter, generally, dispose of all their meat early the next morning.

The cattle usually come from the two great provinces of Minas Geraes and San Paulo, being driven in herds of one hundred to one hundred and fifteen head each, over bad roads, and arrive in tired condition. They cannot be transported by railroad on account of the high freight

tariff. The average weight of a bullock when killed is only about 440 pounds inclusive of the hide, &c.

A tax is paid to the municipality of Rio de Janeiro of 4 milreis, say $1.70, on each bullock, and the province from which it comes collects another tax of 2 milreis per head. The freight by railway from the slaughter-house to the city is about 50 cents for the four quarters.

The meat is retailed at about 11 cents per pound.

The measurement given in the accompanying form are, for length from base of horns to base of tail; of girth, around the animal just behind the fore legs.

C. C. ANDREWS,
Consul-General.

UNITED STATES CONSULATE-GENERAL,
Rio de Janeiro, June 7, 1884.

SPECIAL STATISTICS CONCERNING BRAZILIAN CATTLE.

The common Brazilian attains the following measurements at maturity: Cow, 6 feet girth; bull, 7 feet girth; ox, 11 feet girth. The live weight of the cow is 440 pounds; of the bull, 700 pounds; of the ox, 1,200 pounds. The annual average production of milk is 720 pounds; 12 pounds of milk required to 1 of butter; 5 pounds of milk to 1 of cheese. The average value of product is, meat, $20; milk, $30 per year; cheese $25 per year. The animals reach maturity at from four to five years. The color is a yellowish brown. They originate in Portugal and Spain.

The Furino, used for milk in large towns, produce annually, on an average, 1,200 pounds of milk. The cows measure 6 feet 1 inch in girth, 6 feet 4 inches in length.

The substratum is 10 per cent. limestone; 30 per cent. sandstone; 20 per cent. granite; 20 per cent. clay; 20 per cent. gravel.

The cattle are not housed, except in towns. They feed on natural pasture. Breeding is but little attended to. Beef is generally handled on the hoof; milk, to some extent, by railway.

The altitude is 2,000 feet. The mean temperature 67° Fahrenheit; summer, 75°; winter, 56°.

The soil is 15 per cent. alluvial, 30 per cent. loam, 20 per cent. clay, and 35 per cent. sandy.

UNITED STATES OF COLOMBIA.

CATTLE ON THE PLAINS OF BOGOTA.

REPORT BY VICE-CONSUL BOSHELL.

The cattle of this country is not fit to be exported to the United States on account of their very inferior quality, and the accompanying form could not be filled, as there are no statistics to be obtained here.

Cattle brought from the warmer climate to the cooler plains of Bogota bring with them a pest called here "ranilla," which they transmit in their saliva to the grass, and which is almost always fatal to the animals raised in the cooler climate. The poison which the hot-country cattle bring with them blights the pastures for at least twelve months, and the grass has to be burnt several times during that period to eradicate the disease.

The hot-country cattle lose, after being months on this plain, the power of transmitting the above-mentioned disease.

MARTIN BOSHELL,
Vice-Consul in Charge.

UNITED STATES CONSULATE,
Bogota, December 5, 1883.

REMARKS.

The *Criollo* is a mixed breed between Spanish, Hertford, and Durham. There is no fixed rule as to color—red, black, white, and yellow.

The Hertfords have been bred pure since 1856.

The altitude of the plains of Bogota is 2,560 meters, medium term. The mean temperature is 15° centigrade; same climate all the year round.

Cattle are not housed here; they feed all the year round out in the fields. Breeding is left free. Products are handled as in primitive time.

ECUADOR.

CATTLE BREEDING AND PRODUCTS OF CATTLE IN ECUADOR.

REPORT BY CONSUL BEACH, OF GUAYAQUIL.

In response to circular of July 18, 1883, asking information in regard to the breeding cattle and cattle products in Ecuador, the following facts are given as derived from extensive cattle raisers in different sections:

THE SEASONS IN ECUADOR.

As an introduction, I will state that practically Ecuador has but two seasons of the year—the dry and the rainy. The first usually begins with June and ends with November, and the latter begins with December and ends with May. Each often begins or ends a month earlier or later than the dates given. The "winter," or rainy season, is the warmest by from 5° to 10°. Vegetation of all kinds grows most rapidly during the rainy season, though the influence of the rain is extended for several weeks beyond its cessation. There is usually every year from four to five months when the pasturage is scarce and the cattle have poor subsistence. There are abundant mountain streams that during the dry period might be utilized at small expense in irrigating the land; but the people have not yet reached that degree of agricultural progress.

MILK YIELD.

During the dry season most of the cows give but little if any milk, and the figures given in the subjoined table are for the quantity realized in from six to eight months. The quantity stated (485 pounds average per cow per year) is given under the supposition that all the milk of the cow is included. The general practice is to let the calves run with the cows during the day, separate them at night in corrals, and milk the cows in the morning. Thus they are milked but once a day, and the quantity is not more than one-half of the product of the cow.

Breeds.—The cattle of the country are all "native stock," and have been bred in and in from time immemorial; the only changes have been from one plantation to another. The effect of long inbreeding is degenerated animals—animals of small size—as shown by the table given, and they are of every known cattle hue. The planters inform me that there are no natural obstacles to the raising of as good stock here as in any other part of the world.

NUMBER AND VALUE OF ECUADORIAN CATTLE.

No well-authenticated census has ever been taken in Ecuador, either of the inhabitants or showing the extent of its industries and products. The actual population is approximated very closely, but there is no data showing the quantity or value of agricultural products, except of a very few articles, nearly all of which are exported, their quantity and value being derived from exportation statistics. In an endeavor to reach a conclusion as to the quantity and value of the cattle stock, I adopted different methods. I sought to get an estimate by provinces, but could

only ascertain that near Santa Rosa every 25 miles square would contain 10,000 head; at Loga, the same area, 20,000 head, but for a large extent of the country no kind of an estimate could be obtained. Finally an estimate of the number of cattle killed in the country per day was made, based on known numbers of cattle consumed by a known number of inhabitants. By this method it was ascertained that the number of cattle slaughtered daily is about 1,000, or 365,000 per year. As the cattle are sold at an average of five years old it makes the whole number of live animals 1,825,000. The cattle are sold at an average of $25, making the total value of annual sales $9,125,000. The value of the whole stock, young and old, will average about $18 per head, making total value $32,850,000.

About three-fifths of the cattle raised are cows, and the other two-fifths steers and bulls. The steers are sold as soon as matured, but the cows are kept longer, all finally being sold for beef. Most of the cattle hides are exported to the United States; a few are used by the natives in making bags, "raw-hide ropes," "bed blankets," and the like.

CULTIVATED GRASSES IN ECUADOR.

The *alfalfa* is a very good grass, somewhat of the clover order, which yields largely when well cultivated. The *jeneiro* is a specie of wild grass that grows luxuriantly in wet places, and while it is of inferior quality is in large demand during the dry season, and becomes valuable because always in supply; for four or five months in the year it is the principal food of the horses, mules, and donkeys, in Guayaquil, whose market is supplied by means of canoes.

PROFITABLENESS OF CATTLE RAISING IN ECUADOR.

Plantations are not dear, and by reason of perpetual pasturage cattle raising is one of the most profitable pursuits in Ecuador, and the business is increasing. But the business has some drawbacks, as about 5 per cent. of the stock is killed by tigers, and many animals are stolen. As there are many wild cattle, the result of strays from tame stock, the loss stated is sometimes partially offset by the capture of wild cattle.

HORATIO N. BEACH,
Consul.

UNITED STATES CONSULATE,
Guayaquil, October 26, 1883.

REMARKS.

The cattle are of Spanish origin. At maturity the cow weighs 500 pounds, the bull 600 pounds, and the ox 800 pounds. The annual average production of milk is 485 pounds. They arrive at maturity at from three to five years, usually at four. They are of every color. Oxen are but little used. All cattle are ultimately slaughtered for meat. Only a small part of the milk is sold. Cheese ranks next to meat in importance, but the value of this product is not known. The cattle are confined by corrals. The only method of feeding is by pasture. The hides are mostly shipped. The altitude varies from 0 to 21,500 feet. The mean temperature is 60° Fahrenheit; in summer 55°, in winter 65°. The soil is a sandy loam on the coast, sandy, scoria, &c., in the interior.

PERU.

CATTLE IN PERU.

REPORT BY CONSUL LAPOINT, OF CHICLAYO.

I am in receipt of circular dated July 18, 1883, asking for information relative to breeding of cattle in this department.

In answer I am sorry to say that I am not able to give such information as the Department of State might require.

Cattle in this department are bred in a wild state and no attention is paid to the improvement of the breed. Whenever a supply is wanted, the owner of an estate surrounds his lands and collects the cattle which he requires to sell or to send to market. Milk and butter are very scarce articles, and only to be got on the farms. Peru does not produce sufficient cattle for its use, and large supplies are imported from Chili and the Argentine Republic for consumption in the south.

AMERICAN CATTLE FOR PERU.

I am sure that when the Panama Canal will be finished, and direct steam communication with the United States established, it will be a profitable business to introduce cattle from our country into Peru.

ALFRED LAPOINT,
Vice-Consul.

UNITED STATES CONSULATE,
Chiclayo, November 5, 1883.

VENEZUELA.

CATTLE INTERESTS IN VENEZUELA.

REPORT BY CONSUL BIRD, OF LA GUAYRA.

Certain specific inquiries with reference to cattle in Venezuela having been made by the Department of State through a circular letter lately received at this consulate, the following report is respectfully submitted. It will be observed that, owing to the difficulty of procuring intelligent and accurate information, the subject has been treated in a general manner, but it is hoped that the salient points have been so far recognized, that at least something more than a vague idea of this industry may be communicated, and that some of the matter herein presented may not be devoid of a certain degree of interest to those engaged in similar enterprises in the United States.

As the channels of trade and intercourse with the great pampas of the interior of Venezuela are inadequate to the maintenance of extensive inter-State commerce and for the transportation to the seaboard at reasonable rates of agricultural produce; and as, in such a sparsely populated country, thus deprived of facilities for transportation and communication, the idea of anything like the existence of a home market is naturally precluded, so the attention and interest of the people has been directed to that branch of industry that, with comparatively little care or manual labor, will yield the surest and most remunerative returns, and that, when ready for the market, itself furnishes the means for its own inexpensive transportation.

The Republic of Venezuela has an area of territory of 439,119 square miles, a fraction larger than the States of Louisiana and Texas and the Territory of New Mexico combined; and a population of 2,075,245, not quite as large as that of the State of Missouri. In the interior of the country are vast plains of Government lands practically illimitable, isolated, and uninhabited, though well-watered, salubrious, and fertile, and especially adapted to the raising of cattle.

According to recent stastitics there are 220,000 people engaged in this particular enterprise, though the number of cattle cannot be given with any degree of accuracy. Through the devastating internal revolutions from which the country suffered up to the year 1874, the large and flourishing herds of the plains, exposed to the constant and ruthless depredations of all the hostile armies, were practically decimated. They spared not and paid not; and hence not only were the flocks and herds destroyed, but the rich proprietors were generally reduced to penury and many even to a state of actual want. But under the unbroken peace that has subsisted for the past ten years, and the careful and unremitting efforts of the despoiled *Llaneros* to repair their severe losses, the revival of the industry is assured and the prosperity of the stock raisers reasonably restored.

From all available information and personal observation it may be stated that there is only one class of cattle in Venezuela; for, although there have been, from time to time, some experimental efforts to cross the breed by admixture with American and other stock, it is virtually unchanged. It may be called the Spanish-American breed, since it has

resulted from a cross of the native breed with the Spanish cattle imported in colonial times; but to call it "Texas cattle" would be quite as accurate, and would readily convey to our American people its true class and characteristics; for in all points the cattle of Texas and Venezuela appear to be identical.

The custom of collecting or "rounding up" the cattle of the different sections twice a year for the purpose of identifying, marking, and branding by individual owners, as is practiced in the State of Texas, is common here also; and this, together with the influence of wholesome laws supplemented by the vigorous enforcement of *cowboy regulations*, suffices to settle all doubtful or disputed questions of ownership.

The public domain supplies ample pasturage, where all stock runs untaxed and unrestricted; stock raisers and agriculturists paying no tax whatever to the Government, all the revenues of which are derived from duties levied on imports and exports. Of course it will be understood that on this vast pasture, lying between the sixth and ninth degrees of latitude north, no preparation for wintering stock is necessary; the climate being always from warm to temperate, and the grasses and herbage affording the requisite sustenance throughout the year.

While the price of stock may only be approximately given, it is safe to calculate it at not less than $10 in United States currency per head on ordinary even running lots of cattle over two years old. They have been much higher even, owing to the late wars; but, with continued peace, prices must rule much lower. Owing doubtless to these high prices and the difficulties of transportation, there are no meat-canning establishments in the country; but, with these obstacles removed, the export of canned and refrigerated meats might be large and remunerative. The pasturage, as has been stated, is ample; and while it is quite impossible to give a technical classification of the different grasses, it may be sufficient to say that they comprise annual and perennial varieties of the best quality for raising and fattening cattle.

With all, however, that may be said upon the subject, it is proper to conclude that, at least for some years to come, our own Western prairies must continue to be the best home for the stock-raiser; where, with improved stock, sufficient pasturage, a good and convenient home and foreign market, just laws properly administered, and, *above all*, absolute safety from predatory bands of revolutionists, he may dwell safely in the land, rest serenely in his castle, and reap surely the increase of his flocks and herds.

W. S. BIRD,
Consul.

UNITED STATES CONSULATE,
La Guayra, September 20, 1884.

MARACAIBO.

REPORT BY CONSUL PLUMACHER.

I regret to state that I am unable to give any special information in answer to the Department circular. There are no improved breeds here. The cattle of this part of Venezuela run wild and are not even branded. They come mostly from the Indian country, known as the peninsula of the Goyara. Cattle here are only reared for their hides, and meat for daily consumption. As a rule only the milk of goats and asses is consumed.

E. H. PLUMACHER,
Consul.

UNITED STATES CONSULATE,
Maracaibo, November 30, 1883.

WEST INDIES.

CATTLE IN BERMUDA.

REPORT BY CONSUL ALLEN.

In reply to circular of July 18, 1883, requesting information relative to breeding cattle, I have to say no cattle are bred here that would have any value whatever as stock breeders in the United States.

The Bermuda cow is a small, scrawny animal, of a mongrel breed, is a poor milker, giving only about 3 quarts of milk per day for eight months of the year. A few cows have been imported from the United States and Canada, but they do not do well as a rule, and though well fed with grain, after one or two years they are no better than the native animals.

The Bermuda grass is not adapted to stock-raising, and while it will sustain animal life they will not thrive on it, and cows that are not fed with grain are very poor.

Neither butter nor cheese is made here.

The native beef is very poor and is rarely seen in the markets.

No oxen are used here, and the male calves are slaughtered for veal, except those kept for breeding purposes.

CHAS. M. ALLEN,
Consul.

UNITED STATES CONSULATE,
Bermuda, October 3, 1883.

CATTLE IN SAN DOMINGO.

REPORT BY CONSUL SIMPSON, OF PUERTO PLATA.

I have the honor to return herewith blank which accompanied cattle circular, filled to the best of my ability.

The origin of the breed of cattle on this island seems to be unknown, but is probably Spanish. They are small, give but little milk, and are mainly raised for the butcher.

Few are exported, and, as enough are raised for home consumption, few imported. Bulls are used exclusively for draft purposes. They are gentle and easily handled. No oxen are raised.

Cows have been imported from the United States, but they never seem to thrive, probably from the fact that they were imported from States too far north to suit this warm climate.

There does not seem to be much desire to change or improve the breed, although within a few days two bulls and one cow have been imported from Porto Rico. These animals are said to have come from Spain, and although not large are a decided improvement on the breed here.

THOMAS SIMPSON,
Consul.

UNITED STATES CONSULATE,
Puerto Plata, November 20, 1883.

REMARKS.

The annual average production of milk per cow is 2,920 pounds. No butter or cheese is made. The cattle arrive at maturity when three years old. The live weight of the cow is 300 pounds; of the bull and the ox, 450 pounds. The average weight of meat is 250 pounds. The cattle vary in color; their origin is unknown; they feed at large. There is no housing, and no system of breeding or of handling products. Cultivated grasses: Guinea grass.

The mean temperature is 81°; summer, 91°; winter, 72°.

CATTLE AND CATTLE PRODUCTS IN SAINT THOMAS.

REPORT BY CONSUL SMITH.

I am just in receipt of the cattle circular of July 18, 1883.

There is no information relative to the cattle of Saint Thomas that can be given which will be of any value to the stock-breeders of the United States. There being no fresh water on the island, and but little grass, stock is not bred for any purpose.

There are not to exceed two or three hundred head of cattle on the island. Of this number perhaps one hundred are ordinary Spanish milch cows.

IMPORTS OF CATTLE.

The supply of cattle for the butcher is drawn from the neighboring islands. During the fiscal year ending March 31, 1883, the importations were as follows:

Whence imported.	Head.	Value.
Other Danish West India Islands	145	$2,150
British West India Islands	1,727	11,755
Spanish West India Islands	1,374	35,010
French West India Islands	20	256
Dutch West India Islands	86	1,165
Dominican Republic	3	40
Total	3,355	50,375

A few head are imported at a time in small sloops engaged in that trade.

MEAT IMPORTS FROM THE UNITED STATES.

The expense which would be incurred by keeping a large supply on hand precludes the butchers from negotiating with stock-breeders in the United States for the delivery of such cargoes as would be profitable for them to ship.

The salt and canned meats necessary to supply the demand of the shipping is imported from the United States.

BUTTER AND CHEESE IMPORTS.

Butter is chiefly imported from Denmark, and cheese from Germany and France.

Danish butter keeps better in this climate than does that of any other country. American dealers have frequently sent consignments here, and in most instances have sustained heavy losses thereon, either on account of the quality, or in consequence of its soon becoming rancid and unmerchantable. So long as the quantity of the present quality of butter produced in Denmark is sufficient to supply the increasing demand, it will not be possible for American dealers to extend their trade in this direction with an inferior article.

V. V. SMITH,
Consul.

UNITED STATES CONSULATE,
Saint Thomas, January 8, 1884.

AUSTRALASIA.

THE CATTLE OF NEW ZEALAND.

REPORT BY CONSUL GRIFFIN, OF AUCKLAND.

In replying to the "cattle" circular of July 18th, 1883, I have the honor to return herewith the forms (inclosure No. 1) transmitted to me in November last, and which I have filled up with such information as was possible for me to obtain concerning the cattle in the provincial district of Auckland. I have further the honor to state that the steady annual increase in the exports of New Zealand frozen meat and dairy produce, together with the favorable condition of the country, it being well grassed and watered, have done much to improve the condition of cattle in this colony.

PASTURE LANDS.

Every year new lands are being fenced in and sown with English grasses. The total number of acres in grass in New Zealand in 1883, including land in hay after having been broken up, was 2,018,964 against 1,771,875 for 1882, an increase of 247,189. If, however, the land in oats, barley, and wheat were added, the number of acres in green crops for 1883 would amount to nearly 4,500,000. The value of grass and clover seeds imported annually into the colony is something over $500,000.

Considerable quantities of grass seed, principally timothy and clover, come direct from the United States, and also small quantities of the variety called *alfalfa*. Both the volcanic and light sandy soil of this colony produce rich, succulent grasses, well adapted for fattening cattle without any extra food. Second-rate pastures will generally yield a better profit for the dairy, together with the breeding of cattle and rotation of crops in connection with grazing. The greater portion of second-class pastures require breaking up after grazing from three to four years. Dry, hilly land, and what may be termed as third class, is better adapted for sheep.

NUMBER OF SHEEP AND CATTLE IN NEW ZEALAND.

The sheep industry is by far the most important one in the colony; but I have observed that the increase in the number of sheep during the last decade has not anything like as great pro rata as that of cattle.

The number of sheep in New Zealand in 1884 is estimated at 13,113,412. In 1874 it was 11,704,883, an increase of only 1,408,567. In 1874 the number of cattle in New Zealand was 494,917, and now it is about 1,000,000. The census for cattle is taken in New Zealand every three years. The last census occurred in 1881. It will be taken again in April next, and until then the number of cattle in New Zealand for 1884

can only be given approximately. The subjoined table shows the number of cattle in New Zealand at each census since 1858:

Year.	Number.	Year.	Number.
1858	137,204	1871	436,592
1861	166,285	1874	494,917
1864	249,760	1878	578,430
1867	312,835	1881	698,917

At the last census Auckland district had 158,181 cattle; Taranaki, 51,846; Wellington, 140,951; Hawkes Bay, 36,213; Marlborough, 9,919; Nelson, 31,620; Westland, 7,944; Canterbury, 115,155; Otago, 150,150; Southland, 34,205, and Chatham Island 6,883. About 40 per cent. of these cattle consist of Shorthorns and kindred breeds, and the remainder of Herefords, Devons, Ayreshires, Normans, Jerseys, and mixed breeds, &c.

While New Zealand has produced a higher class of cattle than any of the other Australasian colonies, she is only the fourth in the list in regard to the number of head. Taking the census of 1881 as a guide, Queensland had 4,089,715; New South Wales, 1,859,985; Victoria, 1,207,088; New Zealand, 698,917; South Australia, 306,046; Tasmania, 122,504; Western Australia, 65,473. Total Australasia, 8,429,448.

With the exception of New Zealand, cattle in the Australasian colonies, in spite of everything said to the contrary, do not thrive as well as in the great cattle districts of the United States, and in regard to numbers Texas alone has more than half as many cattle as the Australasian colonies put together.

CATTLE QUARANTINE REGULATIONS.

All the Australasian colonies except New Zealand had for many years prohibitory laws against the importation of cattle. New Zealand, on the contrary, admitted cattle not only from Australia but from Europe and America. Last year, however, the government of the colony issued an order in council prohibiting the importation of live stock from the United States. This order is now very generally admitted to be a mistake. Mr. Robert J. Creighton, the agent of the New Zealand government at San Francisco, has repeatedly pointed out that there is no cattle disease such as rinderpest and foot-and-mouth disease on the Pacific coast. He has also shown that the Texas fever, which cattle-breeders fear so much, has for many years been localized. The old plan of driving cattle long distances, and which was the principal cause of the outbreak of the disease, has been abandoned on account of the facilities afforded for transportation by railway in Texas, New Mexico, and Colorado. The liability to the outbreak of this disease is now reduced to a minimum; moreover, none of these cattle have access to the blooded herd or dairy stock of the country.

The question of quarantine is one in which the authorities on cattle diseases differ widely. The quarantine regulations in nearly all countries are so loosely enforced as to be practically worthless, and always occasion a vast amount of trouble and expense. Besides, many diseases of animals, like those of human beings, are localized. For instance, certain diseases in tropical countries are unknown in cold climates, and

tropical countries are wholly free from many diseases of friged zones, and any attempt to regulate them by quarantine would be useless. When a country happens to be free from a certain disease, even if it should be a disease that cannot be imported, many are inclined to attribute its absence to the existing quarantine regulations.

Now it is well known that there has never been a case of hydrophobia in any one of the Australasian colonies, yet thousands of dogs have been imported from countries where this awful disease is prevalent. If there had been a law against such importations we should doubtless find many persons ready to proclaim that the freedom of the colonies from this disease was due solely to the prohibition.

It is said that the law forbidding the importation of cattle into New Zealand was passed mainly for the benefit of speculators. The prohibition will, of course, enhance temporarily the price of cattle, but in the end will prove very injurious to the cattle industry of the colony. Should there be no further importation of thoroughbreds into New Zealand, in a few years the cattle will not only cease to improve but will vastly deteriorate. The prohibition does not apply to Australia, yet the only cattle disease ever found in the colony was originally brought from Australia.

Some time ago the United States Government appointed a committee of inquiry into the dangers which would arise to that country from the introduction of neat cattle from Europe for the improvement of native breeds, and the committee reported that the introduction of neat cattle did not tend to the spread of contagious or infectious diseases. The operation of the sections of the United States law prohibiting the introduction of neat cattle was therefore suspended, upon the condition that the importers and owners should submit to such orders as the Secretary of the Treasury should from time to time prescribe.

When cattle are quarantined in the United States the arrangements for their reception at the various Government cattle stations are so perfected as to occasion the least possible trouble and expense to the importers. The New Zealand government might will imitate the example of the United States, for there is no infectious cattle disease in the United States that quarantine would not effectually guard against.

In this connection it is well enough to mention that when the British Parliament adopted a resolution prohibiting the importation of cattle from countries where the foot-and-mouth disease prevailed, charges were made in Parliament that such diseases existed in the United States. There appeared to be no other foundation for these charges than the fact that cattle suffering from these diseases had been landed in the United States direct from Great Britain, and that all such cattle had been separated in the most thorough and complete manner from the American herds. The United States Treasury Cattle Commission reported from Boston, Mass., July 21, 1883, as follows:

Beginning with the great rendezvous of cattle at Kansas City, Council Bluffs, and Omaha we have made careful investigations along all the lines of cattle traffic as far as the Eastern seaboard. In this investigation we have included all the great stock-yards where cattle are detained for feeding, watering, sale, &c.; all the great feeding-stables connected with distilleries, and starch, glucose, and other factories; all the city dairies where stock-yards exist and where the herds are replenished from such stock-yards, and to a large extent the great dairying districts into which cows are drawn from the above-named stock-yards and lines of travel. Up to the present date we have made observations in the stock-yards at the seaboard—the terminal end of our cattle traffic and that to which all infection must gravitate—but apart from the imported cases from Great Britain we have been unable to find a single case of the foot-and-mouth disease complained of.

NEW ZEALAND CATTLE IN THE UNITED STATES.

The high class of cattle in this colony and the low price at which they can be obtained has very naturally attracted the attention of the cattle-breeders in the United States. In August, 1883, Mr. A. W. Sisson, of California, dispatched Mr. Rollin P. Saxe, a cattle expert, to New Zealand to purchase for him a band of pure-blooded Herefords. Mr. Saxe arrived in Auckland in September, 1883, and after visiting several of the cattle districts in the colony purchased 20 two-year-old heifers in calf and 24 bulls from one to two years old from the New Zealand Stock and Pedigree Company, of Auckland. Mr. Saxe was not only surprised at the superb condition of the company's cattle but at the low prices at which they were sold. They were shipped to San Francisco by the Pacific Mail steamer City of Sydney in October last, being the first shipment of New Zealand bred cattle ever made to the United States.

Mr. Saxe is of the opinion that Hereford cattle can be more easily and economically brought to California from New Zealand than across the continent by railway from Illinois and other States celebrated for this particular breed. In Illinois these cattle sell at from $500 to $5,000 per head, whereas they can be bought in New Zealand at from $100 to $700 per head. Arrangements, it is said, have been made for monthly shipments of Herefords from Auckland to California, and Mr. Craig, of San Francisco, has proposed to establish a distributing farm for them on the Contra Costa Slope near Oakland. It is noteworthy that the two breeds of cattle most largely in demand in the United States, viz, the Jersey and the Hereford, thrive better in New Zealand than any other kind of cattle. The Jerseys are nothing like as numerous as the Herefords, from the fact that they were introduced at a much later period, but it is well known that they do equally as well. My attention has recently been called by stock farmers, to the high prices which these breeds bring in America. At the Kellog combination sale in New York last June a yearling bull, King Ashantee, brought $5,600; a six-year-old cow brought $1,900, and a two-year-old heifer brought $1,650, and many others at similar figures. These prices, however, were eclipsed at a subsequent period at Mr. T. S. Cooper's sale in Connecticut. At Mr. Cooper's sale 119 Jerseys averaged $952.50 each, and a thirty-three months' old heifer brought $5,150, and a five-year-old cow brought $2,800.

NEW ZEALAND HEREFORDS.

The New Zealand Stock and Pedigree Company, of Auckland, has one of the largest herds of pure-bred Herefords in the world. This breed has long been a favorite one here. They are tough, hardy, and are able to pick their food on poor soil, and when two and three years old outweigh any other breed, and are famous for their high-priced meat; that is to say, their loins are well developed, and their yield of succulent and porter-house and sirloin are proportionately heavy. The hind quarters of the pure-bred Hereford are long from the hip backwards. The thighs are large and full and well meated at the hocks. The whole carcass is set square on good, short legs standing well apart. The flesh is firm and the hide mellow, with soft, hair, not too fine, but giving the impression that it can be stretched to any extent.

The color of this breed is a distinct red, with white face, mane, and white breast and legs as far as the knee. As an evidence of how they stand hard feed it is said that during the long drought of 1878 and

1879, in Australia, about 5 per cent. of the Herefords were lost on a run in Queensland, against 10 per cent. of the Shorthorn herd and 20 per cent. of the stud Shorthorn. In one large paddock there were seventy Shorthorn and seventy Hereford bulls one and two years old. The Shorthorns got so poor that they had to be turned out on the run, the paddocks being bare of grass, but the Herefords kept in good, strong condition.

When Captain Cook first visited New Zealand there were no cattle in the country, but at a subsequent period some were introduced from Australia. In the early settlement of the colony the length of time occupied in a voyage from England, and the many difficulties which had to be overcome by the pioneers, prevented any special attention being given to the improvement of the breed of cattle by importation, as that necessarily involved a heavy expenditure of money, not to say anything of the time and patience required to introduce them; but at last the colonists began to improve their herds by the introduction of thoroughbreds from Europe, and I have not the slightest hesitation in saying that nearly all the imported cattle thrive better in New Zealand than in their native homes, and that this superiority is developed to a still higher degree in their offspring.

NEW ZEALAND SHORTHORNS.

The Shorthorns, as I have stated previously, outnumber those of any other breed in New Zealand. They were amongst the first pure-blooded cattle imported into the colony, and have ever since been very popular on account of the prevailing impression that they are the best suited for improving the breed of inferior cattle and for adapting themselves to different kinds of soil and climate. Those who keep up the pure strain prefer the roan color to any other, though in large herds red and white are not uncommon. Any sign of black is regarded as an impurity of blood and is not bred from, but are drafted off to the butcher. The cows of this breed are believed to give milk for a longer period than any other and, when dry, fatten rapidly.

The largest prices ever paid for New Zealand cattle have been paid for Shorthorns. Messrs. R. and E. Maclean, of Auckland district, for many years gave great attention to this breed.

The famous bulls Duke of Newcastle and Duke of Cambridge, now the property of the New Zealand Stock and Pedigree Company, were bred by the Messrs. Maclean. These bulls took the first prizes at the Auckland agricultural shows, and attracted so much attention amongst judges of stock that they were sent to Sydney in 1878. At that time they were said to be the finest specimens of cattle ever seen in New South Wales. The Duke of Cambridge, dam Lady Eleanor, a prize-taker at the West of England shows at Taunton and Exeter, and his sire the 25th Baron Wetherby, came of the celebrated Siddington tribe of pure Bates, the property of Mr. Bowley. The Duke of Cambridge is of a light-roan color, and at four years of age was very massive, with great thickness through and of immense depth, with capital underline, good spring of the rib, and level back. His companion, the Duke of New Castle, a rich roan, was calved in November, 1875, got by Ninth Colonel Tregunter, dam Countess of Taunton by Duke of Somerset (26012), grand dam Windsor, 1st by Red Windsor (24926), 3d of Crocus by Henry 1st (26370), 4th dam Cowslip by Saladin. This is a pure Bates pedigree of great excellence. His sire, 9th Colonel Tregunter, was out of a Siddington cow, Dutchess 94th, and has an un-

broken line of thirteen Dutchesses in his pedigree. The Duke of New Castle is of a beautiful roan color, has a fine head and well-shaped neck.

Each of these bulls took first prizes in their respective classes at the cattle show at Sydney, one being for three years and over and the other for two years and under three. In addition to this the Duke of New Castle was awarded the first and champion prize for the best bull of any breed, for which the whole of the Australasian colonies competed, and it is said that the owners refused for him an offer of 2,000 guineas ($10,000).

NEW ZEALAND POLLED CATTLE.

The steady demand for black Polled Aberdeen Angus cattle in the United States has increased the price of this breed fully 50 per cent. in Scotland.

The Polled Angus being natives of a cold climate are, of course, of a hardy breed, and on that account are well adapted to the severe winters of America, and, moreover, it is said they require no artificial feeding. In the climate of North New Zealand, where they do not require housing, it is thought they will do even better than in colder countries. Although as yet this breed is confined principally to the colder latitudes in the south island, it is thought they will soon be distributed throughout the colony. I learn from a late number of the North British Agriculturist that Mr. W. S. Davidson was fortunate enough while in Scotland to secure for New Zealand the celebrated Pride heifer and a pair of yearling bulls of the Aberdeen Angus variety.

Mr. Davidson also purchased for New Zealand, Solomon (2,349 pounds), of the celebrated Sybil family and winner of the third prize at the last Inverness show. The animal was bred by the Earl of Southesk, and is the produce of the first prize national societies' animals, Sybil 2nd, of Tillyfour (3526) and Knight of the Shire (1699). The cost, like that of both parents, was considerable. Mr. Davidson also bought from Mr. George S. Grant, Achorachan, Glenlivet, at a high price, the yearling son of the prize cow Patience of Corskie (1932), bred at Drumin, and of select pedigree. The sire of the yearling was the Erica Pride bull Proud Viscount (1246). The Sybil bull is a son of a member of the late Mr. McCombie's Paris group, while the Patience yearling is half brother to the celebrated heifer Pavilion (3772) which, exhibited by the Earl of Airlie, carried everything before her at the national shows. Recently some New Zealand bred Polled cattle have been exported to Australia. Two of these were shipped to Queensland; one of these, a yearling heifer from Mr. Auld's cow Pride of Aberdeen, brought the sum of 510 guineas ($2,550), and the cow Pride of Aberdeen brought 385 guineas ($1,925). These cattle were the property of the New Zealand Land Company, and were entirely grass-fed on the company's estate near Omaru.

NEW ZEALAND DEVONS.

The Devons, next to the Shorthorns and Herefords, are the most numerous in New Zealand, and in time will become fully as popular. Mr. James Dilworth, who was formerly president of the New Zealand Agricultural and Pastoral Association, says that the Devons are an excellent breed and thrive remarkably well in the Auckland district. He says that some cattle experts think them superior to the Shorthorns, but, owing to the fact that little knowledge prevails in regard to them, they have not obtained the rank they deserve. They are smaller than the

Herefords, are of a dark-red color, white nose, full eye, and fine horns. Mr. Thomas Allen, to whom I am indebted for much of the material in this report, is of the opinion that the Devonshire oxen are unrivaled at the plow, especially if the ground is not too heavy. They have a quickness of action which no other breed of cattle can equal.

Ox labor is no longer employed in England, but Mr. Allen thinks that years will elapse before such labor can be dispensed with in New Zealand. He says that no better breed can be found for the purpose than the Devon. They have better dairy qualities than the Herefords, but do not grow or fatten so rapidly on rough feed. They are, however, profitable to the butcher and prove to be better than they look.

AYRSHIRES.

Ayrshires are also a favorite breed here. They come next to the Devons in regard to numbers, and are especially adapted for the dairy. They give a great quantity of milk and for a long period. They are found in New Zealand of various colors, principally red and white and sometimes brown and white.

The Ayrshire steers, unlike the Herefords, do not make good beef, and are usually sold for veal and the heifers reared for the dairy. Mr. Dilworth owns a pure-blooded heifer of this breed that at one time produced as much as 23 pounds of butter per week, and now averages from 12 to 15 pounds per week.

ALDERNEYS.

The Alderneys are not numerous in New Zealand, and are looked upon as fancy cattle rather than profitable ones. They are kept here for the richness and quality of their milk, but are not used in large dairies. They are of little value to the grazier.

MIXED BREEDS.

In addition to the distinct breeds I have described there are a great number of cross-bred cattle in New Zealand, from the Longhorn down to the colonial bred Polled cattle. During the spring and summer months thousands of cattle are fattened and slaughtered from the ordinary pastures without the aid of either roots or artificial food. In some parts of the colony cattle are fattened on the open pastures all through the year. In districts subject to frost, it is necessary to grow a good supply of roots and hay on which to fatten the cattle during the winter. Stall feeding or even housing the cattle during the winter nights is quite the exception here. Some pure-bred cattle kept for stud purposes are stall fed, and on some dairy farms the cows in milk are housed at night during the three winter months, when they are fed on hay and roots, grazing the paddocks during the day, but the greater number are left out all the year round without shade or shelter. On some of the large runs herds of breeding cows are kept, and the calves are left to run with their mothers till they are four or five months old, when they are drafted off to a distant part of the run and weaned out of sight and sound of each other. The young stock thus bred are reared and some times fattened. If the feed is not good enough they are sold to the graziers to fatten, the difference between the value of store and fat cattle being the grazier's profit.

PRICE OF NEW ZEALAND CATTLE.

Three-year-old steers are worth in Auckland from $20 to $30 each, and when fat they realize from $35 to $55, the market being a very fluctuating one. The cattle are sold at per head, the calculation being a guess one of per 100 pounds dead. The auctioneer's quotations vary from $4.25 to $7.50 per 100 pounds of beef, the price depending on the supply, but the former is often the midsummer price and the latter the midwinter or early spring.

DAIRY FARMING IN NEW ZEALAND.

Dairy farming is carried on with profit in New Zealand by a large proportion of the settlers, especially when the family can do the work, without employing much extra help. Near the large towns and cities considerable quantities of milk are consumed fresh, some farmers retailing their own milk, while others sell wholesale to the dairy companies or dealers, who sometimes receive it by railway from 10 to 30 miles. The dealers generally pay from 10 to 16 cents per gallon for the milk. The business of butter and cheese making, combined with rearing calves and pigs, is profitably followed when the distance from the city or railway will not allow the milk to be sold fresh. Several cheese factories are now in full working order in the colony, the machinery for which was imported from the United States. The farmers supply the milk from a radius of 3 to 5 miles to these factories at from 7 to 8 cents per gallon, and find it more profitable than butter-making.

NUMBER OF DISTINCT BREEDS IN NEW ZEALAND.

There are quite as many different kinds of cattle in New Zealand as in the United States. Mr. Dilworth says ten distinct breeds are known to exist in the colony, and there may be some others (recent importations) in the south island that have not as yet come under his knowledge. The following are the names of the different breeds of cattle in New Zealand: Shorthorns or Durhams, Herefords, Ayrshires, Devons, Black Polled Angus, Jerseys, Alderneys, Normans, and Bretons. The Shorthorns and the Herefords are the two principal breeds. The New Zealand Stock and Pedigree Company own a herd of the latter, pure blood, numbering over seven hundred.

One of the most striking facts in connection with the cattle industry of this colony is their wonderful immunity from diseases which cause such devastation in Australia. For instance, pleuro-pneumonia cannot live in New Zealand. This dreadful disease was introduced here on two occasions from Australia, but at once assumed a very mild type, and soon disappeared altogether. Another fact almost as interesting is that cattle are never vicious in New Zealand. It is well known in Auckland district that cattle will not fight one another. I have often observed that when bulls of an equal age are turned into a paddock together for the first time, they will not take notice of each other. I have also observed that in large dairies where fresh cows are repeatedly introduced it is never necessary to cut or cap their horns.

COST OF TRANSPORTATION.

The cost for shipping cattle per head to San Francisco via the Pacific Mail Steamship Company is $150 to $200. This cost would be materially lessened if they were shipped in sufficient numbers to justify

the company in making arrangements for regular shipments. The cost of transportation from London to Auckland via the steamers of the New Zealand Shipping Company and the Shaw, Saville, and Albion & Co. is from $200 to $250 per head. The expense of feeding aboard ship, both on the San Francisco steamers and the direct steamers to London, is about 2 shillings (48 cents) per day. The food consists of 25 pounds of oaten hay, 25 pounds of oaten chaff, and a little bran.

The cost of transporting cattle from London to New Zealand has been materially reduced since the establishment of a direct steamship service with this colony, and I am informed that after the 1st of March next the charges for transporting all kinds of live stock via the New Zealand Shipping Company will be fully 25 per cent. less than the present rates.

G. W. GRIFFIN,
Consul.

UNITED STATES CONSULATE,
Auckland, N. Z., February 4, 1884.

CATTLE STATISTICS OF NEW ZEALAND.

The Shorthorn cattle give an annual average of 4,380 pounds of milk. In this climate they will milk nearly the year round. Ten pounds of milk produce 1 pound of cheese. Their live weight is, cow, 1,300 pounds; bull, 2,000 pounds; ox, 1,400 pounds. They arrive at maturity at four years: The average weight of meat at maturity is 800 pounds. The cows are red, roan, and white; red and roans being preferred. The pure breeds come from English stock, and are descended from cattle imported from Holland during the last century by English breeders.

The cattle are not housed in this country. They are mostly grass fed, with, in winter, two feeds per day of oaten hay, turnips, or clover hay. The products are handled mostly through storekeepers and commission merchants. This is caused by there being no dairy farming on a large scale.

The mean temperature of Auckland is 59.3; in winter, 65.4. Alluvial, loam, clay, and sandy soils are found in New Zealand scattered over large areas, and even in the district of Auckland. Timothy is not much cultivated, but clover (principally red and white) is largely cultivated. Rye grasses, perennial Italian and English.

CATTLE IN TASMANIA.

REPORT BY CONSUL WEBSTER, OF HOBART.

With reference to cattle circular of 18th July and accompanying memoranda, I have the honor to say with regret that, after consulting the government inspector of stock, I find that no records are kept which would enable me to supply you with reliable information.

Comparatively little attention has been paid here to cattle breeding The total number of cattle in the island is 122,500 only.

A. G. WEBSTER,
Consul.

CONSULATE OF THE UNITED STATES,
Hobart, November 28, 1883.

CATTLE IN VICTORIA.

REPORT BY CONSUL-GENERAL SPENCER.

Referring to circular letter of July 18, 1883, relative to stock breeding and dairy products in this colony, I herewith transmit all the information I have been able to obtain on the subject, which is, I regret to say, very meager and unsatisfactory.

On the receipt of the circular I placed myself in communication with the secretary of agriculture for this colony, requesting him to furnish me, so far as practicable, with the desired information.

On the receipt of his reply, in view of the disappointing character of the information thus obtained, I addressed a circular letter to the leading cattle-breeders and dairymen of this colony, but with only indifferent success.

As the result of my inquiries and observations, I am led to believe that the United States has little or nothing to learn in respect to cattle breeding and dairy farming from Australia, where both these industries may be regarded as still in their experimental stage.

With a boundless pasturage and a most propitious climate, rendering housing or hand-feeding unnecessary, all the year round, there has hitherto been no necessity for conducting these and similar industries on strictly scientific principles; hence I account for the unsatisfactory character of the information obtained.

O. M. SPENCER,
Consul-General.

UNITED STATES CONSULATE-GENERAL,
Melbourne, May 16, 1884.

ASIA.

CATTLE IN SYRIA.

REPORT BY CONSUL ROBESON, OF BEIRUT.

In compliance with Department circular dated July 18, 1883, desiring information relative to breeding cattle, which will be of use to stock-raisers in the United States, I have now the honor to submit my report on the breeding, raising, &c., of cattle in this part of Turkey.

BREEDS OF CATTLE IN SYRIA.

It will be seen from the accompanying table that there are three breeds of cattle in Syria: Joulany (of Bashan); Belady (native or common); Haysy (of Damascus).

The Joulany breed are black in color, and are supposed to have been originally brought from Bashan, in the eastern country beyond the Jordan. They are well formed and hardy, and the meat is sweet and tender. (The natives of this country use but little if any beef.) The gross average weight of the Joulany at three years old may be put down as follows: The bull and ox from 500 to 600 pounds; the cow from 450 to 500 pounds. The Belady differs very little from the Joulany in weight or form. In color they are, as a rule, dark-brown, but vary.

Both of the above-named breeds are used for plowing, in fact all the plowing in Syria is done by cattle—neither horses, mules, nor camels being used for the cultivation of the soil.

The Haysy breed (Damascene) are reddish-brown in color, slightly larger than either the Joulany or the Belady, and are considered the best breed for milk and butter. There is very little attention given, however, to the breeding and raising of cattle in Syria.

BREEDING AND RAISING SYRIAN CATTLE.

The natives generally breed from bulls before they are two years of age, instead of mature animals; nor do they give any special attention to feeding or housing; they have no barns or sheds for housing cattle or other stock. The cattle are generally kept in the yard of the owner when not grazing in the commons or plowing. The grazing is rather poor in most parts of the country, but in the Hauran and the plains of Damascus, the pastures are good for six or seven months in the year. (From May till October we have no rain, consequently, where the land is not irrigated, the vegetation dries up.) In the Lebanon Mountain the cattle are generally left to graze on the hills during the summer season; the grazing being very poor they become very thin. In autumn mulberry and grape-vine leaves are gathered and given for food to cattle, while during the winter they are fed with wheat straw, cut fine, and the dry residue of the mulberry leaves left by the silk-worms. In some parts of the Bekaah plains the peasants raise buffalo, which give abundant supplies of rich milk; but these animals are not good for beef. The peasants who raise the most if not all of the cattle in this

country do not allow the calves to suckle more than a few days after they have been dropped; when seven or eight days old they are taken from the cows and are fed on grass and other food. This system injures the calves very much, and they soon become thin and weak. The Arabs, however, think that taking the milk that nature intended for the calf and selling it is a clear gain.

MEAT, MILK, AND CHEESE IN SYRIA.

The best breeds for beef are the two first, viz, the Joulany and Belady. The Damascene are considered the best for milk and butter, but are harder to keep, taking twice as much food as either of the other breeds. It is difficult to get any statistics of the quantity of butter or cheese manufactured in the country. Butter is sold fresh as soon as taken from the milk; none is kept in stock or prepared for exportation. The quantity of cheese made is so small that the manufacture of cheese cannot be considered an industry in Syria.

There is no way of finding out the number of cattle in my consular district, nor the percentage of the several breeds or the percentage bred for the dairy and beef, nor the increase or decrease of stock. The cattle seem to be sufficient for all the demands, as none are imported.

The best bulls can be purchased at a price varying from $75 to $100; cows from $70 to $90.

EXPORT OF SYRIAN CATTLE TO THE UNITED STATES.

The best method for exporting cattle to the United States from Syria is by one of the English lines of steamers plying between Beirut and Liverpool, there to be reshipped.

The cost per head for cattle, from the best information I can get, will be $75 to $80, including food, &c.; for a number better, rates might be obtained.

I have seen fine cattle about Damascus, and I am of the opinion that with careful breeding and proper raising Syrian cattle are worthy of the attention of American stock-raisers and farmers.

SHEEP.

I think that the flat-tailed sheep of Syria are well adapted to many parts of the United States, especially the Southwestern States and Territories. They make good mutton, are hardy, and grow to a large size. Their fleeces are fine, weighing from 12 to 15 pounds each. The wool is of the best quality for making carpets and other heavy woolen goods. The average price of sheep is $5 per head. The cost of exportation to the United States via Liverpool would be about $30 per head, including food.

PROHIBITED.*

I beg to remind all who may be interested in the exportation of horses, mules, donkeys, cattle, and sheep from Turkey that the same is prohibited by the laws of the Ottoman Empire.

JOHN T. ROBESON,
Consul.

UNITED STATES CONSULATE,
Beirut, March 30, 1884.

* In his report upon the "Angora goat," published in No. 31, for July, 1883, Consul-General Heap thus refers to the prohibition of the export of live animals:

"After the last shipment of goats to the Cape in 1880, the Turkish Government prohibited the export of Angora goats. This was done in response to a petition on the

Special statistics concerning cattle in Syria.

Name of breed.	Name of country.	Daily average pounds of milk.	Pounds of milk required to 1 pound of butter.	Pounds of milk required to 1 pound of cheese.	Size at maturity (feet).				Live weight.		Age at maturity.	Average weight of meat at maturity.	Description.
					Cow.		Bull and ox.						
					Height.	Length.	Height.	Length.	Cow.	Ox.			
									Lbs.	Lbs.	Yrs.		
Joulany ...	Beaham	11	17	6	4	6⅛	4 1/16	6 1/12	559	579	3	440	Black; great power of endurance.
Belady.....	Coast and interior.	10	17	6	4	6	4 1/12	6¼	546	566	3	430	Dark brown; compact and well knit.
Haysy.....	Mount Lebanon and the district of Damascus.	16	17	6	4	6⅛	5 1/12	7	650	670	3	511	Reddish br'wn; tall and slender legs.

There are no barns or sheds for housing cattle, &c. They are generally kept in the yard of the owner. In spring and summer they are let out to graze. In autumn fresh mulberry and vine leaves are given them for food. During winter they are fed with wheat straw, &c.

Topography and climate of Syria.

Districts.	Altitude.	Mean temperature.	Summer.	Winter.	Soil.			
					Alluvial.	Loam.	Clay.	Sandy, &c.
		°F.						
Joulany.....	2,000	70	75	55	.....	In part (and rocky).	.....	
Belady*.....	.....	75	85	65	.....	In part.....	.....	Mostly.
Haysy	2,500	65	80	60	Alluvial.	.....	.....	

*Mostly on sea-coast.

subject sent in by the native dealers in mohair, who became alarmed at the rapid development of the industry at the Cape, which they supposed was the cause of the depreciation in the value of mohair. The true cause of the depreciation has been mentioned under the heading of 'Export and price of mohair.'

"This prohibition had nominally been in force for many years, and was in reality only renewed in 1880, but, like all other governmental edicts in this country, it can be overcome and need not stand in the way of intending importers. Some small outlay may have to be made to obtain a permit for exportation. Shortly after the prohibition the writer had a permit of exportation offered to him for 2,000 goats. The safest way, however, would be to apply for a permit through the minister of the United States, who would no doubt obtain it."

CEYLON.

CATTLE OF CEYLON.

REPORT BY CONSUL MOREY.

DIFFICULTIES WHICH BESET CATTLE-BREEDING IN CEYLON.

The materials for a report upon the cattle of Ceylon are very meager. The climate of the low country is too humid and the pasturage too poor for the vigorous support of the large animals sometimes imported from Europe, Australia, and the hill districts of India, nor can they be said to thrive greatly in the more elevated region, for even there the natural grasses are neither nutritious nor wholesome, and if these species of cattle are not largely fed on grain or roots they fall off in condition and die early, having in the mean time produced a degenerate progeny.

I have it on the authority of a European lady, who has a taste for the breeding of improved cattle, and who has expended large sums of money and much time and attention in that direction, that her early efforts in Nuwar Eliya, which is the sanitarium of Ceylon and over 6,000 feet above sea-level, were very disappointing, in consequence of her best animals often dying of intestinal complaints. Post-mortems finally disclosed the fact that much of the grass they had consumed was so hard and wiry that it had resisted digestion and remained in the animal in the form of large fibrous balls, which completely stopped intestinal operations and caused death.

The plan finally adopted by this persevering lady to preserve alive such of her surplus stock, principally cows out of milk and youngsters, as it was impracticable to keep stall-fed, was to send them down to Pussellawa, to a coffee estate about 3,000 feet above sea-level, where they were fed on cultivated grass, for the sake of their manure, and thus the stock was for a considerable time kept in fairly good condition. Eventually, however, the said coffee estate went under different management, when, owing either to a neglect about cultivating the grass or to not feeding it to the cattle, those poor brutes were, to my knowledge, soon reduced to a most pitiable state of starvation, from which it proved impossible to recover them, and the moiety if not the whole of that choice herd is now extinct.

Most other people's attempts at rearing improved stock here have resulted about the same, and, although there are in the central province, where most of these operations were carried on, some very nice stock of mixed parentage, still it has been reared at a cost far beyond its value, and if not kept up by fresh importations of new blood from abroad, will probably degenerate and run out in the course of another decade. It also seems to be very difficult to improve the common Singhalese cattle by crossing them with foreigners (see Plate 1); for whatever the present improvement, principally in size, may be, such progeny are generally wanting in hardiness, and crosses likely to work an improvement in this respect are difficult of accomplishment. Some beautiful bulls of the Amrut Mahal (Milk Palace) breed, which I imported

in a herd of Mysore cattle, in 1875, could not be enticed into intercourse with Singhalese cows, though intermixture does commonly occur between other varieties and the Singhalese breed.

SINGHALESE CATTLE.

The ordinary cattle of Ceylon are probably descended from breeds inhabiting the Telugu country of India, as they resemble very closely, in conformation and color, the cattle now common there; whereas there are great differences in these respects between them and the breeds of that portion of India lying nearly opposite this island, whence it might naturally be expected that such animals would have been introduced. It must be remembered, however, that the Indian conquerors of Ceylon and founders of the Singhalese race of people, came from the Telugu district, about 550 B. C., and subsequently kept up an active and constant communication with their fatherland, obtaining from there even their wives, priests, raiment, and very likely their domestic animals.

I therefore believe that the popularly termed Singhalese cattle are mainly the offspring of Telugu stock; and though somewhat degenerate in size, and now almost inconsequential for dairy purposes, are nevertheless better suited to this climate and for the ordinary needs of this insular people than any other variety at present known.

The largest of them do not exceed 4 feet in height, measured to the top of the hump, over the withers, nor weigh above 350 pounds alive. The females are about 6 inches lower, owing not only to ordinary reduced stature, but to an unproportionally small hump development, as compared to the males.

The maximum amount of milk yielded by a cow under favorable conditions is about 2 quarts per diem, exclusive of enough to support life in the calf. In the absence, by death or otherwise, of her offspring, the mother ceases to give milk altogether, so that in some cases where a calf has died its skin has been stuffed and presented to the mother at milking time, and thus, for a short period at least, through this deception, the animal would be induced to give down her secretions.

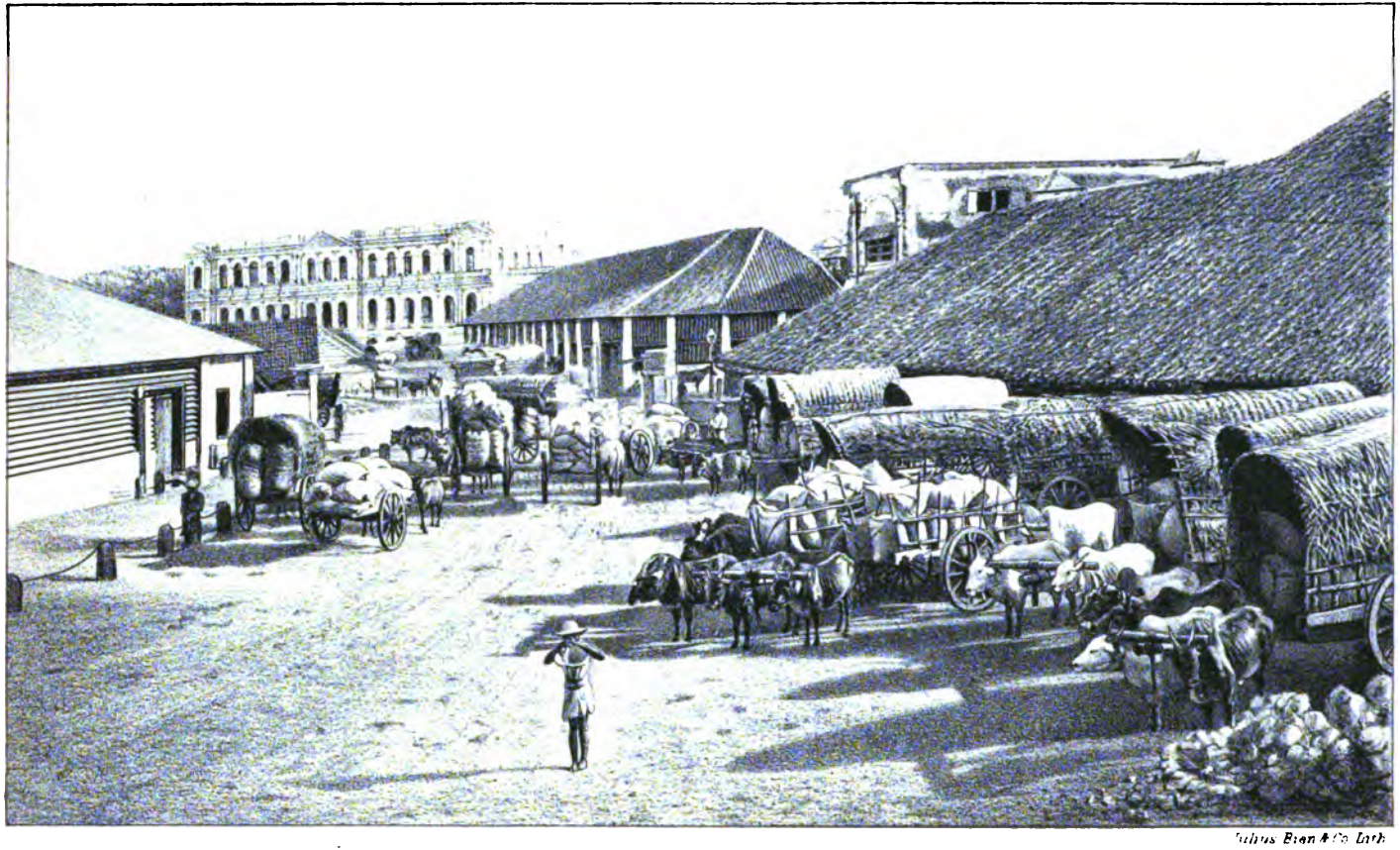
Under liberal treatment a very good cow, especially if she be a fond mother, will yield milk for nine months, but as a rule six months is about the milking term. If she depend upon grass altogether for sustenance her mess of milk will be reduced one-half, and the maximum amount is only obtained by feeding with some cotton seed and poonac (cocoanut-oil cake).

For draft purposes, the males are, for their size, wonderfully good, and capable of drawing comparatively enormous loads. Hitched in pairs to huge two-wheeled carts, they may be seen any day, in our seaport towns, struggling along with a load of twenty-one bags of rice, equivalent to 3,300 pounds weight; and yet they are mere pigmies, poorly fed and miserably housed, or more frequently not sheltered at all, but left tied in some open court and made to lie upon the bare ground or brick pavements.

Many of them, generally of smaller size, are kept by the natives to draw singly the family "bandy," a light two-wheeled vehicle, often seemingly hardly big enough for one person, and yet, by some remarkable method of close stowage, mutual forbearance, and mysterious adhesiveness of the occupants, made to contain four or five people, large and small; with which load the sturdy little bull trots away, at the rate of 6 or 7 miles an hour, and if the driver entertains a con-

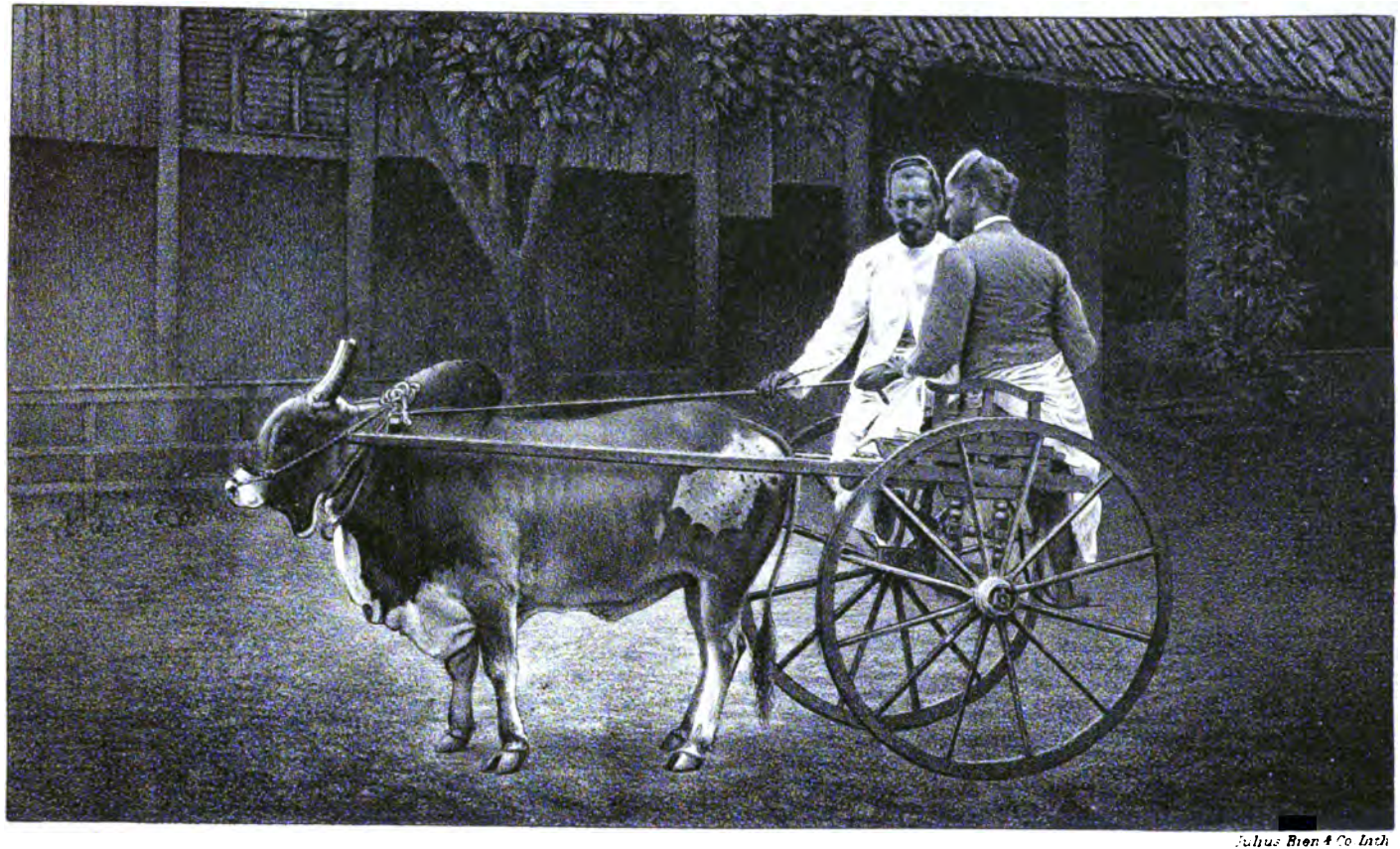
Julius Beer & Co. Lith

A BULLOCK CART. HALF BRED SINGHALESE BULLOCKS



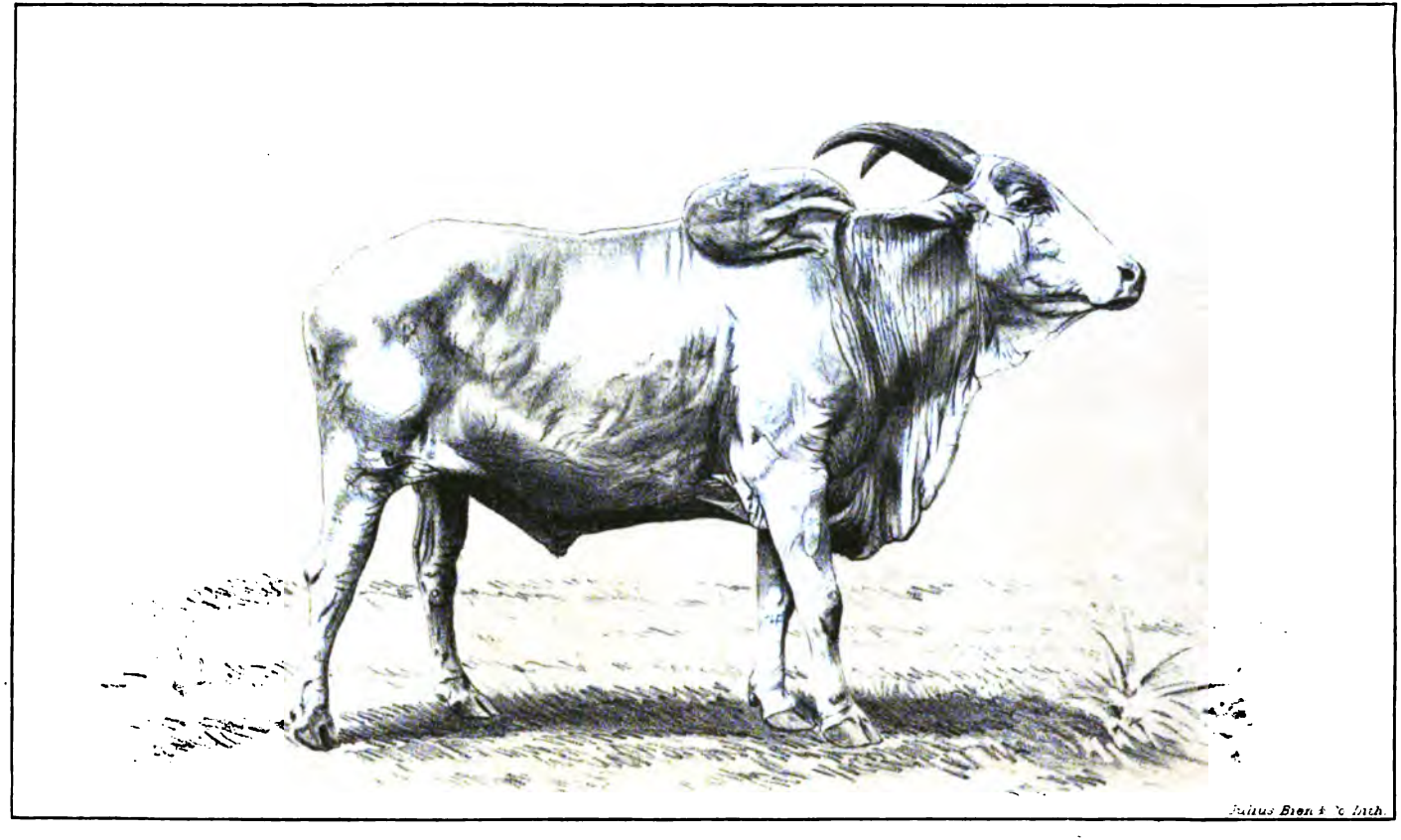
Julius Bien & Co. Lith.

SINGHALESE DRAUGHT BULLOCKS, COLOMBO, CEYLON

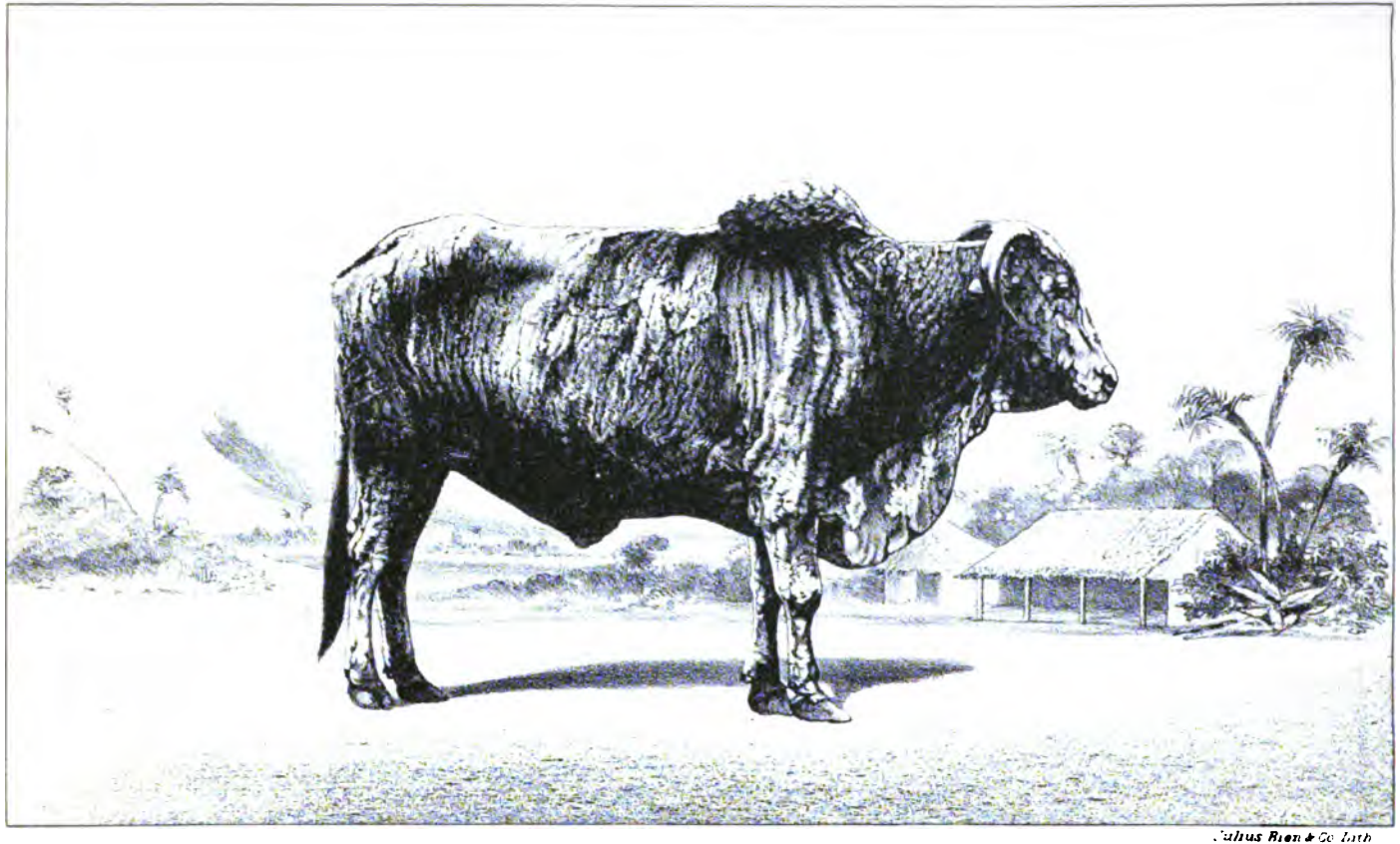


Julius Bien & Co. Lith

SINGHALESE FAMILY BANDY

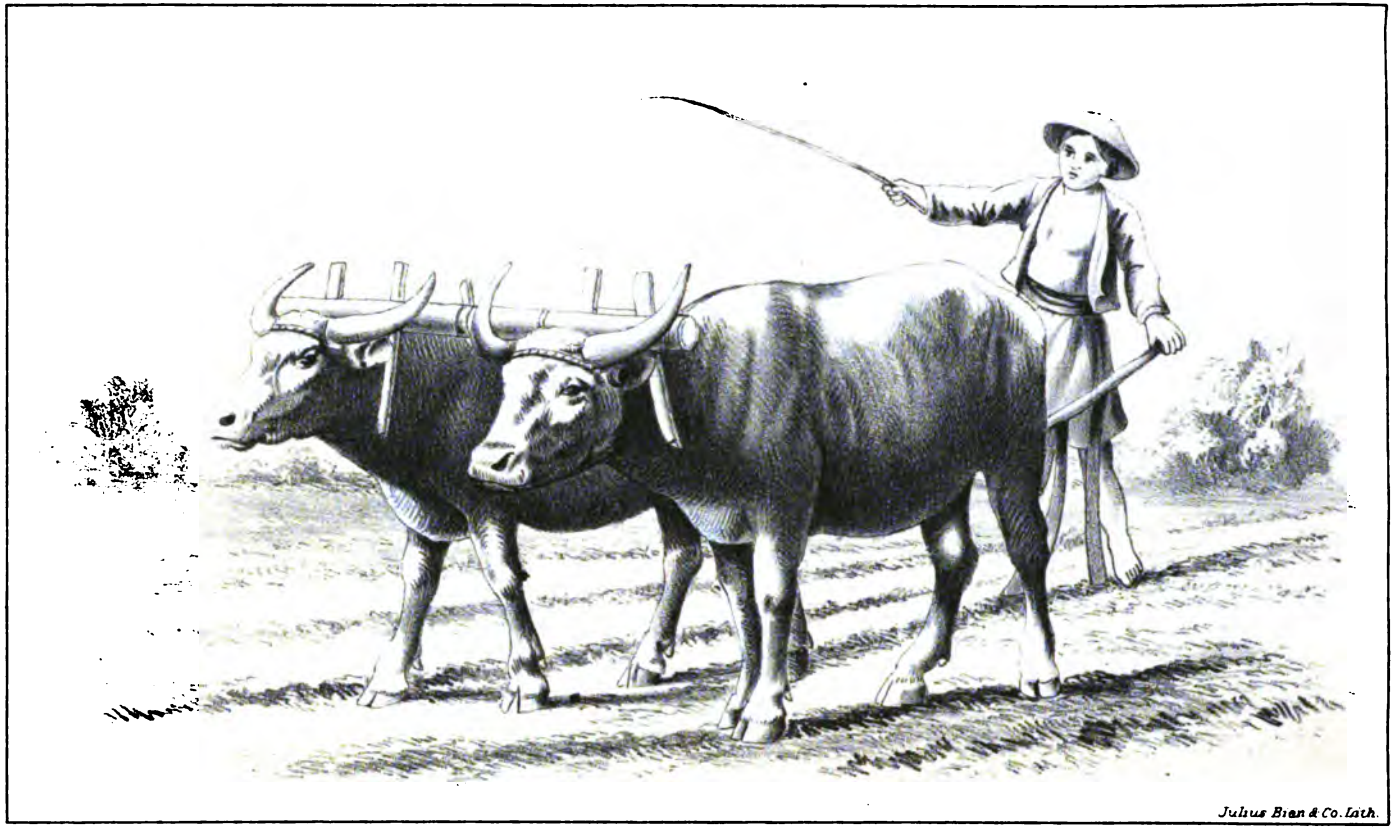


COAST BULLOCK TANJORE DRAUGHT OX

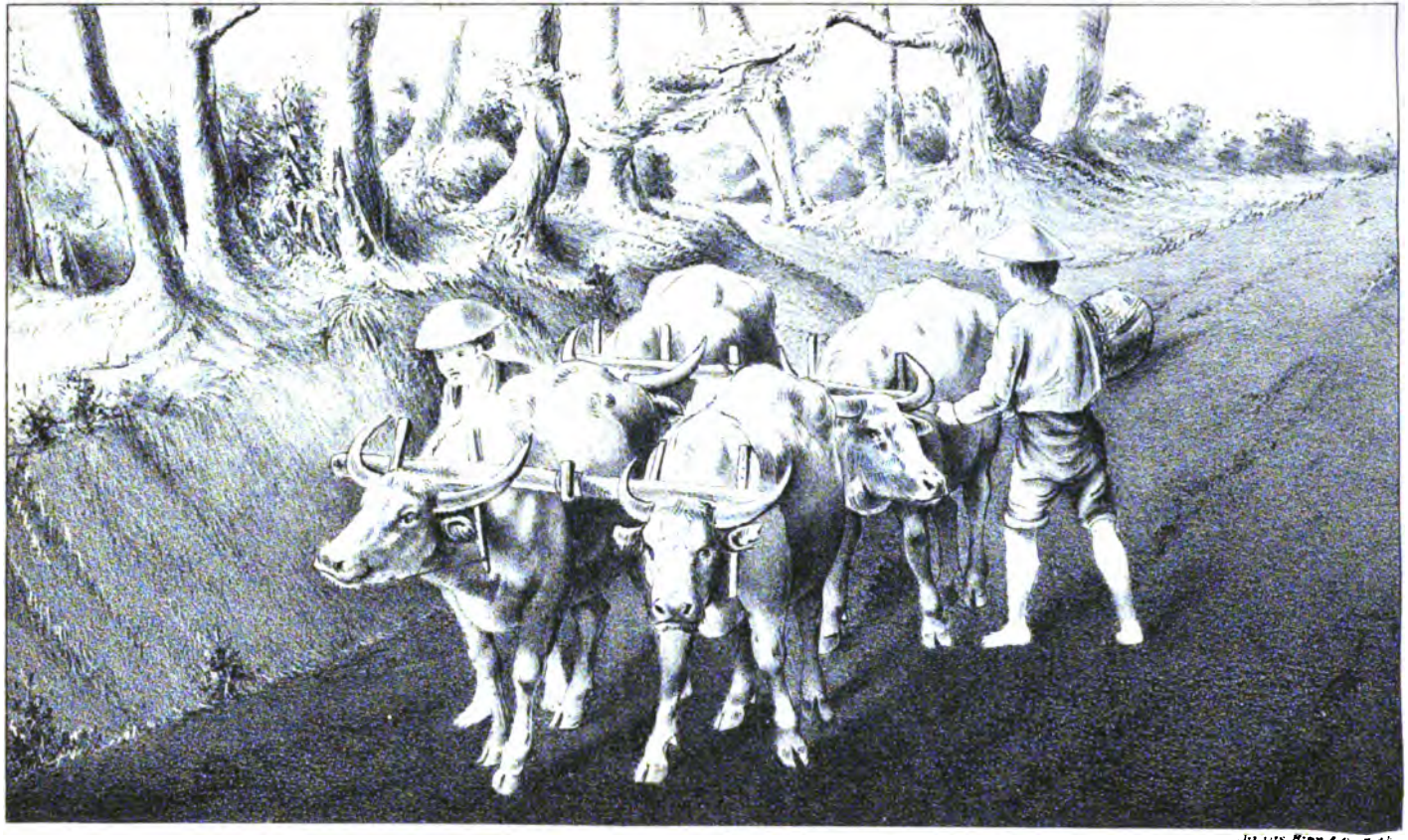


Julius Rien & Co. Lith

HALF-BRED DRAUGHT BULLOCK

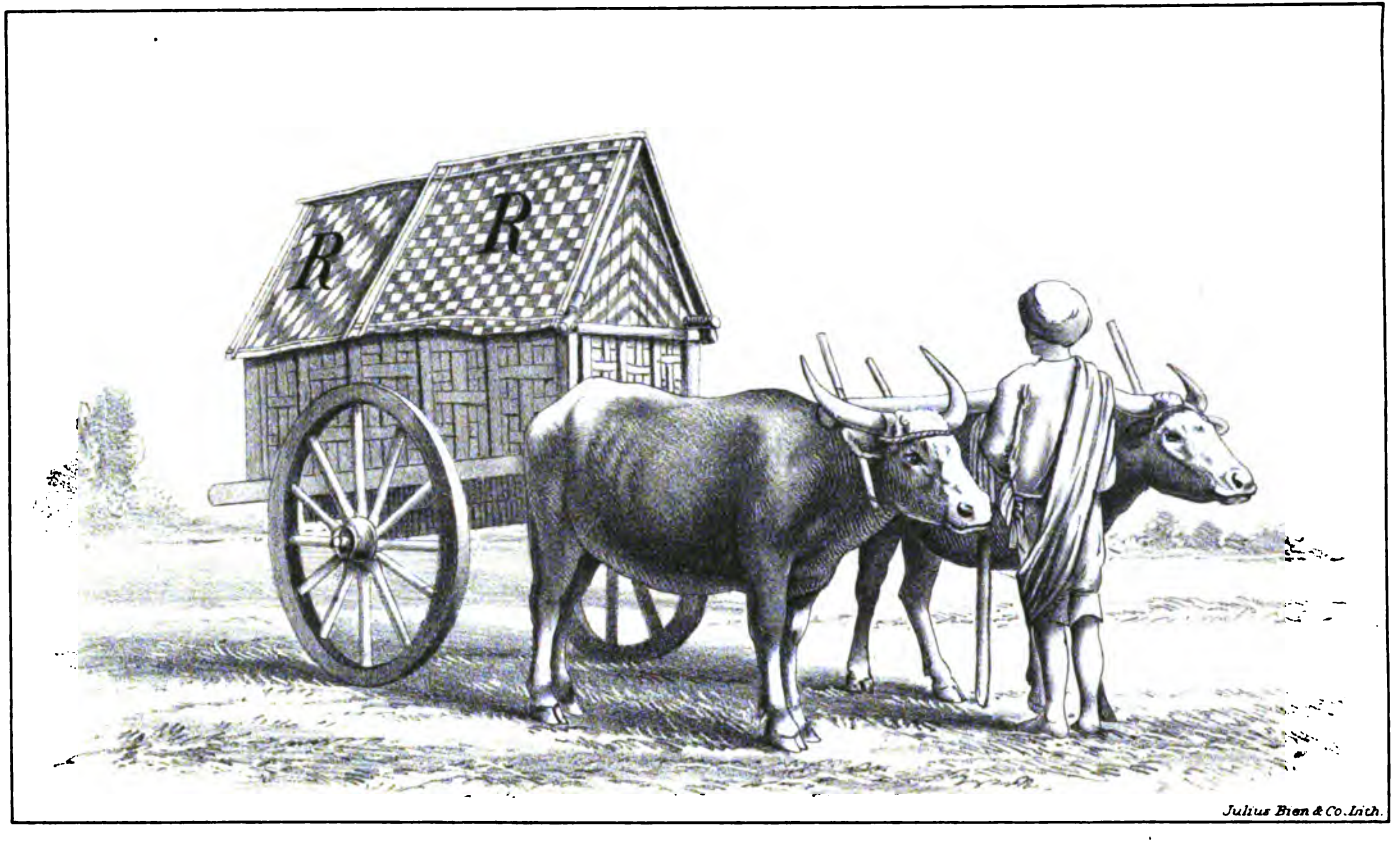


PLOWING IN CEYLON.



Julius Bien & Co. Lith.

HAULING TIMBER IN CEYLON



CEYLON BUFFALO CART.

ceit about his animal being fast, the poor thing will have to race, load or no load, with every other turnout of the same sort that comes along. Then the shrieks and wild howlings of the rival jehus are almost unearthly, and the twisting of the poor brutes' tails, as a last resort to increase their locomotion, is incessant and positively inhuman.

These little animals are treated with much care, and only used as roadsters; whereas the mothers, and in fact all of their cows, when out of milk, are put to the plow by the rural Singhalese, who would much sooner behave thus ignobly towards the weak and obedient females than be put to the bother and expense of keeping unruly male animals for such purposes.

The Singhalese cattle are of all colors—though black, very dark-brown, and red, are the prevailing colors. When white appears to any considerable extent it indicates an intermixture with other blood, and forebodes a want of hardiness. Many of the male animals are branded all over the body, in huge designs, after the style of lace or fretwork, and this is done for ornament originally, although there is a belief that it improves the stamina and condition of a bullock to so brand it. Accordingly, whenever an inhuman cartman has by overwork, cruel neglect, and starvation, reduced his animals to almost the last extremity, he gives them a few days' rest, meantime calling in some fiend with firing irons, who cauterizes the wretched creatures into popular condition for further labor.

In fact these people have a proverb (as I believe most other folks have) to justify monstrosities and foolishness), viz., that "the bullock will come to its owner once a year, and ask to be branded." Here let me state that this practice of such doubtful utility, to say the best of it, renders the hides of the animals almost worthless to the tanner, as, wherever a hot iron has touched an animal's skin, the leather will be fatally defective.

IMPORTED CATTLE IN CEYLON.

In years past, before railroads were common, and when, owing to a large production of coffee, money was plentiful, many excellent draft cattle of large size were imported, and Plate No. 4 fairly represents those of a breed coming from Tanjore, which, though of fair longevity in their own country, where the climate is dry, do not last long here when put to work in the interior where, at high altitudes, cold rainy weather prevails, causing amongst them such serious mortality that now, fresh importations having fallen off for want of a demand, but few respectable specimens of this really fine breed are to be seen here.

Some of our rich estate proprietors in prosperous times also got down Nellore cattle, bulls and cows, both for draft and the dairy purposes for which they excel, but the cost of their keep, for they require to be almost entirely stall-fed in Ceylon, and the absolute necessity for careful European control and supervision, which is expensive and not always to be had, render them a luxury which, owing also to early mortality, is somewhat transient, and only to be enjoyed by the wealthy, a class not common here now.

There are a few reputable speciments of these Nellore cattle still to be found in Ceylon, but I cannot regard them as fair representative types of the breed. There are also Australian of mixed European blood, and some English cattle, but the same conditions required by the Nellores also largely apply to them and are not available, consequently the breed is disappearing fast.

There are crosses between the English and some Indian breeds to be seen, which to my mind, especially on account of their superior stamina to withstand the varieties and peculiarities of the climate, are of greater local utility than their originals. Plate No. 5 represents poorly a good specimen of them, viz, a draft bullock well known here, possessing all of the best points in some measure of both varieties in his parentage and having their marked characteristics amalgamated and toned down in a highly useful and interesting manner, viz: the Nellores long and somewhat stilty limbs are shortened in the cross-bred and their proportions altered, so that the animal, though standing on shorter legs, has long and muscular thighs with short cannons, and the body, somewhat lengthened and broadened, covers more ground, which points, together with the retention of the massy fore quarters of the Nellore, renders its mixed offspring more efficient for heavy draft and capable of faster locomotion.

The photograph does the animal injustice with respect to these points, owing to the picture having been taken in a circumscribed space on a rainy day, and there was no opportunity of getting a better one. Occasionally one meets with a nice animal of this sort which it generally transpires on inquiry is prized by the owner above any other of his stock. The color is sometimes a light striped brindle, but generally a rich iron gray.

BUFFALOS.

The common Buffalos also inhabit Ceylon and are found both wild in the interior and partially tame in the Singhalese villages where they are kept and used to trample the paddy (rice) lands after plowing and to be sometimes milked, though not often, as they are fierce and troublesome, and their yield of milk small and of poor quality. Their flesh is almost inedible.

It is different, however, with their congeners from Southern India, which are larger and tamer, and often imported for dairy use in considerable numbers, for they are fairly tractable and give a good supply of wholesome milk, and being kept in the neighborhood of large towns and allowed to feed upon the commons, they present an interesting sight to strangers who are astonished at their almost hairless uncouth forms, the very exemplification of ugliness; and the wonder is still further increased, when the awkward beasts, to avoid the midday heat, wade deliberately into the neighboring ponds, submerging their bodies, until only their noses, raised almost perpendicular, protrude above the water, presenting the appearance of a shoal of alligators.

No successful attempt at crossing these animals with true cattle has, I believe, been made; the mixed progeny, whenever any appeared, having invariably died young.

SUMMARY.

It will be seen from what is hereinbefore written, that a species of dwarfed cattle, too insignificant in every respect for Western purposes, though well suited to the small wants of a simple people, is the only permanently successful and largely useful breed in the island; and this, by some natural interposition, is suited to live in a climate, graduating through all degrees of temperature, from extreme torrid in the low country, to mild frigid on the hills, and to subsist upon such poor vegetation as grows in the meanest soils of almost every description known

to geologists; whereas no known breed of superior cattle can exist upon the natural pasturage of the island and endure the climate, accompanied with the tormenting attacks of the land leeches, which are common in damp weather, up to an altitude of at least 4,000 feet, unless it be in the Horton Plains, which have not been practically tried. Therefore, it seems impracticable to attempt the filling up of the tables attached to the circular letter now under reply, and for that reason I hope the omission will be excused.

I would have illustrated this report with colored plates, but did not consider it of sufficient importance to warrant so much elaboration, more especially as the photographs (except No. 5) fairly represent their subjects.

W. MOREY,
Consul.

UNITED STATES CONSULATE,
Colombo, November 1, 1883.

MALAYSIA.

THE WATER BUFFALO OF SIAM AND MALAYSIA.

REPORT BY CONSUL STUDER, OF SINGAPORE.

I have to acknowledge the receipt of a Department circular of date July 18 last, addressed to the consular officers of the United States.

I have carefully and repeatedly read and reflected upon the forms and memoranda just alluded to, and, while fully impressed with the great importance to the agricultural interests of the United States of the subject contemplated in the said circular, I can truly say, as a native-born Swiss and as an American citizen who has resided for a number of years in the State of Iowa, engaged in farming, owning and breeding stock, that any information I can give about the territory and provinces lying within the limits of my consular jurisdiction and adjacent countries or islands can be of no practical benefit whatever to the stock-breeders of the United States, whatever interest it may have otherwise as a contribution toward a full understanding of the whole question of cattle-raising; and were I ever so willing to obtain and give the information required in any way in accordance with the said forms and memoranda, I feel fully certain that no one here, with any degree of satisfaction to myself and to the Department, could give it to me.

The colony of the Straits Settlements and intervening Malay provinces under British protection (the territory within my consular jurisdiction) is not a cattle-breeding country, notwithstanding that districts therein are devoted, more or less, to agriculture; and very nearly all the cattle used in the same for beef and for draft purposes, the passenger traffic excepted, are imported from Siam and some of the suzerain Malayan provinces nearest to Siam proper; from Burmah and Bengal, but mostly from the Coromandel coast; and they are peculiar breeds of cattle not met with anywhere in Europe or America, and seemingly specially adapted to the tropics. They are lop-eared and hunchbacked, with a very thin covering of hair.

There are several varieties as to size, color, form, horns, and strength. The best as to weight and strength and power of endurance under a tropical sun come from the Madras coast chiefly, and occasionally from Bengal (the largest size), and Siam.

The cattle of the countries alluded to, I feel certain, could not endure the climate of the United States, except perhaps the extreme southern parts of Louisiana, Florida, and Texas. And as the cattle of our Southern States are much larger, finer, and inured to the climate, and giving far better returns in beef and dairy products (quantity and quality), I fail to see what any one would gain by importing stock for breeding or race-mixing purposes from India.

There are a few Hindoos engaged in the dairy business, keeping small herds of cows. They raise calves, keep the heifers, sell the steers to cartmen, while the old worthless cows are disposed of for beef. The owners of worn-out cattle, after allowing them a few weeks' rest on coarse tough grass (called ballang), sell the same also for beef, so called.

Beef cattle are really not indigenous to any portion of jungle-covered Malaysia; the buffalo alone finding subsistence therein. But the latter is not used for dairy purposes, and buffalo meat is only eaten, owing to its toughness and unpleasant flavor, by the lowest and poorest classes, chiefly Chinese, when it is eaten at all. But for purposes of heavy draft, such as plowing, cart, or log-hauling, the buffalo, being a ponderous and most powerful beast, much larger and heavier than our largest American ox, is unexcelled in point of strength and power of endurance; but mud-holes, fords, swamps, or creeks, places where he can wallow and bathe, are necessary for this animal. For the cultivation of rice he is therefore invaluable to the natives. He must be unhitched when he gets restive, this being a sign that he wants to bathe. If this is not done he becomes, as a rule, dangerous.

I have seen buffalos in size and weight about half way between a very large ox and an average elephant.

They have very heavy, ponderous, and peculiar horns, resembling somewhat those of the western American buffalo, only very much larger. They are a sort of mouse-colored (as a chief color), from pinkish blue to dark in shade, and have an exceeding thin coating of hair (if any at all), the tail (bushy at the end), ears, and head excepted. They are very numerous in the rice-growing districts in Siam, and everywhere met with where there are native settlements on the peninsula of Malacca and all through Malaysia, and at Penang more than at Singapore.

They are unsafe, often very dangerous and vicious. The Malays and natives of Siam, who breed them almost alone, understand how to manage and work them.

In the jungles of the Malayan peninsula there is a wild species, exceedingly dangerous, going in herds.

The buffalo (really known as the "Water Buffalo") I believe could not live, or not live long, outside of hot, moist, and swampy countries; he must have mud and water, and for that reason alone it would be extremely difficult to bring him over a great sea distance.

A. G. STUDER,
Consul.

UNITED STATES CONSULATE,
Singapore, November 9, 1883.

THE JAVA BUFFALO.

REPORT BY CONSUL HATFIELD.

I have to acknowledge the receipt of circular relative to breeding foreign cattle in the United States.

There is, however, very little, if any, information of interest bearing upon this important question procurable here, and but one kind of cattle that could be imported, if at all, into the United States; even then, the South would, for climatic reasons, have to be selected. * * *

I refer here to the Java Buffalo, an animal well-nigh indispensable to the native, a beast of burden when alive, and furnishing food, hides, and bone when slaughtered.

I am very sorry to say that, after having tried to get from more than one authority such data as desired on the second page of your circular, I find it not procurable, nor does it seem that any bureau, department, or private party can supply the same.

The buffalo is about the size of our ox—of a dull steel-gray color, though at times of pinkish-white. * * *

The animal serves as the ox when alive, and is slaughtered for food. The meat is, however, much tougher and coarser than that of ordinary beef, does not cost as much, and as a result is only consumed by natives and the poorer classes generally. His food is grass, and experience here has proven that he thrives best when not kraalled, but allowed to graze at large and in the neighborhood of a pond or slow-running stream of water. A buffalo will invariably take to this water, immerse himself up to his neck, and remain there happy and content for five or six hours every day if he can.

Certain portions of this island and Sumatra have suffered much during the past four or five years from a plague attacking this cattle, and the government has done all it well could to prevent a spread of the disease, with fairly satisfactory results. The plan adopted has been to promptly kill any animal attacked, and in many cases those with it in the same herd. Farmers in several cases have cried out against this system as entailing unnecessary expense upon the government (who make good the value to the owner) and hardship upon the farmers.

It certainly is seen that the treatment to which these animals have been subjected by European veterinary surgeons, in kraalling them and preventing their free access to the water, has not brought about the anticipated result, for many sound beasts have been found to get ill under it, thus causing the extermination of all.

OSCAR HATFIELD.
Consul.

CONSULATE OF THE UNITED STATES,
Batavia, January 11, 1884.

JAPAN.

CATTLE IN JAPAN.

REPORT OF CONSUL JONES, OF NAGASAKI.

I have the honor to acknowledge letter of the Department of State of July 18, 1883, desiring information relative to breeding cattle for the benefit of the stock-breeders of the United States.

Japan cannot be said to be a stock-breeding country. Previous to the arrival and settlement of foreigners in the country—now some twenty-five years—beef, milk, butter, and cheese were not used by the natives as articles of food, and were in fact unknown to them.

There are no words in the Japanese language for beef, butter, and cheese, except those recently framed from the English for convenience' sake, and in use only at the treaty port. These words are not known or used in the interior of the country.

There are no farms in Japan, as an American understands the meaning of the word farms. There are, instead, small fields and patches of ground, bounded by ditches and water-courses, which are highly cultivated, but more as gardens than farms. Consequently there are no ranges for stock, and the grass of the country is coarse and of poor quality.

Sheep will not live on the grasses of Japan.

The cattle are apparently a degenerate breed, brought originally from China or Corea.

The bullock is used as a draft animal for packing purposes, and in the cultivation of the soil—plowing, &c.

The cow gives but little milk; merely sufficient for their calves.

When killed and dressed by the butchers the cow will weigh from 250 pounds to 400 pounds; the bullock, from 350 to 450 pounds.

Beef in the markets at Nagasaki sells for about 12 cents a pound.

It will thus be seen that there are no facts connected with cattle-breeding in Japan that would be of any interest or use to the stock-raisers of the United States.

ALEXANDER C. JONES,
Consul.

UNITED STATES CONSULATE,
Nagasaki, Japan, December 12, 1883.

CHINA.

CATTLE IN THE YANG-TSE-KIANG VALLEY.

REPORT BY CONSUL SHEPARD, OF HANKOW.

I have the honor to submit the following as my response to Department circular of July 18, 1883, relative to cattle, their breeds in this consular jurisdiction, their treatment, and collateral topics.

The location of this consulate and its dependencies is entirely in the valley of the River Yang-tse-Kiang, extending from the port of Kiu-Kiang to Chung-Ching, a distance of about 1,000 miles. I have pursued investigations upon the points presented in the forms accompanying the circular, by correspondence and otherwise, for the entire distance, as thoroughly as the means at my command would allow, and the information given is as exhaustive as a summary will permit. It is presented in detail, rather than on the forms given, on account of the varied nature of the region reported on.

TOPOGRAPHY OF THE YANG-TSE-KIANG VALLEY.

The topography of territory presents differing features at differing points, but the soil, being all bordering upon the Yang-tse River, is principally alluvial, with loam, clay, and sand observable at special localities, but not generally predominant.

The altitude at any station in the entire district of country under consideration has never been taken, as far as I can discover. My only means of estimating it is from the flow of the river, taken in connection with distance from tide water. But the rate of fall per mile is indeterminate, varying so widely in estimates given that I cannot fix upon an average with any certainty. In low stages of water the effect of the ocean tides is visibly felt for three to four hundred miles from the sea. I judge, therefore, that the fall of the water is little more than would be produced by the curvature of the earth, and this leads me to conclude that Hankow is about 50 to 60 feet above sea level. Places farther up would of course have a proportionate altitude when situated in the river valley, but highlands in the interior, often approaching close to the river banks, rise to lofty elevations.

The temperature has no great variation in the whole distance, and I therefore select that at Ichang, for the year 1883, as that port is 400 miles above Hankow, and about the central point between the extremes of the territory.

Records of thermometer and barometer at Ichang for 1883.

Months.	Thermometer.				Barometer.	
	Highest.	Lowest.	Highest average.	Lowest average.	Highest.	Lowest.
	°	°	°	°		
January	53	30	44	35	31.61	29.75
February	52	31	45	38	30.46	29.96
March	71	41	61	50	30.30	29.64
April	77	49	68	59	30.32	29.51
May	82	60	72	65	30.18	29.69
June	89	68	82	72	29.95	29.69
July	93	71	85	76	29.87	29.58
August	92	73	83	76	30.06	29.68
September	93	61	78	70	30.37	29.77
October	80	49	69	62	30.54	30.06
November	64	39	54	48	30.50	30.01
December	56	34	52	41	30.56	30.12

From a short distance above Kiu-Kiang to near Hankow sandstone is met with, and is a very superior building stone, much used for foundations and trimmings for the more pretentious buildings, and also for banding the river banks.

About Hankow, and for miles above, limestone abounds, and immense quarries that have evidently been worked for centuries, with no signs of exhaustion, approach almost to the banks of the river, where lime-kilns are met with at frequent intervals, constantly employed in the process of calcining the stone for buildings and kindred uses. An immense traffic both up and down the river grows out of this industry, most useful to the people.

Clay also abounds, and bricks of extreme hardness, of flinty strength, of a dark slate color, are made in vast quantities. Crucibles are also made from clay in the near vicinity of Hankow, said to be of unsurpassed excellence.

Granite and gravel are found in a variety of locations, the former more inland than geological formations already referred to.

There are no grasses cultivated, and hay is not gathered as an industrial product. A coarse, wild, swamp grass is found everywhere. Wheat and oats are extensive field products, but I have never seen rye under cultivation here; and timothy and clover are unknown. Occasionally one meets with a few blosoms of small, sweet, white clover, and they are probably the result of scattered seeds from lawn planting by foreigners with imported grasses.

BREEDS OF CATTLE IN THE YANG-TSE VALLEY.

There are only two breeds of cattle in the entire region, and I think neither has any characteristics to recommend it for exportation and adoption, even for experiment in the United States. I present the characteristics of each separately, and other particulars will apply to both alike.

THE COMMON YANG-TSE CATTLE.

The common cow is a small-sized, compact animal, weighing about 400 pounds on the average, and produces young in the third year. She may be considered mature after that, and lives about twenty years. The bull and ox of the species are 20 per cent. heavier than the cow, and all are broken to labor, the purpose for which they are kept, in the

third year. The color is generally a dark red, sometimes piebald. Limbs are short and bones small. Horns are short, nearly straight, blunt and ugly in form, usually of about equal size from base to tip. Milk and its components are little used by the people, and I cannot learn that butter or cheese is ever made, in this part of the Empire at least. The only estimate to be relied upon that I can give of their milking qualities I have obtained of a foreigner, who keeps a small dairy to accommodate the foreign population with milk only. From his experience about 3 quarts per day is the highest average. The flesh makes good beef when decently fed, but the animals are not killed until they are past breeding and too old for work. The dried skin weighs about 27 to 28 pounds, and the bones and offal are comparatively small. Calves are small, and the first year develop slowly. One familiar with fine milkers in the United States is surprised at the very small udders of these cows, and their teats are very small and diminutive. The milk veins, however, are large, and whether culture and careful breeding would develop profitable qualities only experimental trial can decide. The origin of the breed I cannot discover, but, from all I can learn, it seems to have been here as long as the Chinaman himself. The current value per head is not over ten and a half gold dollars.

THE WATER BUFFALO OF THE YANG-TSE.

The water Buffalo is the only other bovine in this region. It is the same animal that is found in India and Egypt. Webster's Unabridged Dictionary, illustrated edition of 1878, has a quite accurate representation of the animal. It is there described zoologically as "a species of the genus *Bos* (*Bos bubalus*), originally from India, but now found in most of the warmer countries of the eastern continent. It is larger and less docile than the common ox, and is fond of marshy places and rivers." This is a very correct idea of it. The cow is as large as a common ox in the United States. It is of a dun or slate color, with coarse hair, bristly and sparse. It comes to maturity in the fourth year, and gestates once in eighteen months thereafter, producing eight or nine calves in a life-time, which is about eighteen years. The young are broken to work in the second year, and the cows are quite as much used for milk as the commoner small breed, yielding a third more. It will perform double the labor of the small animals, and might be worth testing as a draft animal, but it is not to be forgotten that it is very sluggish at work, moving very slowly, and is not infrequently fierce and intractable. It will certainly thrive on much poorer food than our cattle at home, and it makes very good beef. The average weight of cows is 700 pounds, and of bulls and oxen 850 to 950 pounds. Its current value is $15 to $18 per head.

METHODS OF HOUSING AND FEEDING.

When housed at all, bamboo sheds are provided—poor affairs at the best, and yet about as good as the people who own them occupy.

Feeding for either class of the cattle described is only done in the winter months, when vegetation is destroyed; then wheat straw, rice straw, and sweet-potato vines are fed to them. The last are esteemed their best food. In the open season they are left to forage for themselves, browsing upon wild grass, bamboo shoots, and the foliage of the reeds that cover the marshes, or whatever else they can pick up. They are unrestricted in range by either fence or wall, and when for-

aging are kept from cultivated fields by a guiding-cord attached to a ring in the nose, when a small boy leads them, or more often sits upon the backs of the animals and from his perch directs them to the best browsing grounds.

BREEDING.

No attention is paid to selection. The cows are allowed their own course under gestative impulse, and find their mates by force of instinct only. Hence the cattle have been bred in and in for ages, and have undoubtedly degenerated.

NUMBER OF CATTLE IN THE VALLEY.

The total number of either breed it is utterly impossible even to guess at, as no statistics are accessible, and probably none ever existed in any part of the Empire. The stock is amply sufficient for the needs of the people, but no surplus is exported, nor is any sort of product from the cattle an article of merchandise save the hides and horns. These indicate immense numbers of cattle scattered over the Empire; but I have never seen more than two or three animals the property of one man or one household. R. E. Bredon, esq., commissioner of customs, and a most intelligent observer, in a recent report commenting on the increase in the quantity of hides exported, estimates that five times as many animals are left alive as the skins represent, and well says:

> It looks as if there must be many more horned cattle than is generally supposed, when the district within reach of one treaty port supports nearly 700,000 head.

Following out this idea, and of an approximation to the total number of cattle within a reasonable distance of Hankow, let me call attention to the export of hides from this port as given in my annual report for 1882, and more recently detailed by months for the same period. These show the total amount sent from this port alone at over 3,730,000 pounds. At the highest weight given for a single hide, 28 pounds, the total involves the slaughter of more than 133,000 cattle. But the returns for 1883 show a still more noticeable total. The export for the last year was 54,116½ piculs, equal to 7,215,545 pounds, of hides. At the rate of 28 pounds for each hide we have 257,698 skins, and if five living cattle were left behind for each one slaughtered it shows the enormous amount of 1,288,490 cattle on December 31, 1883, supported in the district of country furnishing the exports to Hankow alone. But I am bound to say I think the given weight of a single dried skin is about twice too large, and the allowance of five times as many live cattle left as are slaughtered too small by 100 per cent. If I am correct in this the total live cattle as given above should be quadrupled. Either conclusion shows the Chinese much more of a beef-eating people than they have ever been supposed to be.

EXPORT OF YANG-TSE CATTLE TO THE UNITED STATES.

The method of exportation, should any be desirable, would be by river steamer to Shanghai, thence by the Japanese steamers to Yokohama, and thence by Pacific Mail steamers to San Francisco, occupying probably six weeks. A native Chinaman to care for half a dozen cattle could be hired for $6 per month, and the food would probably cost $5 to $10 per head per month. Passage money and cost of freight can better be learned at the Pacific Mail office than from me.

CONCLUSION.

I have thus endeavored to exhaust the memoranda accompanying the circular I am responding to. My report has been unavoidably delayed from necessity in the endeavor to be accurate, and from the great distances I have had to investigate, with very meager opportunities for intelligent correspondence. I believe I have touched upon all the facts that were suggested, and I trust to have acceptably met the purposes of the Department.

ISAAC S. SHEPARD,
Consul.

UNITED STATES CONSULATE.
Hankow, March 5, 1884.

CATTLE IN SOUTHERN CHINA.

REPORT BY CONSUL SEYMOUR, OF CANTON.

There are no cattle raised in the vicinity of Canton, or Southern China, that are desirable for importation into any other country. The cattle are generally of the Buffalo breed, with humps on their backs, and usually with little or no hair on their hides. Their meat is so undesirable that families who require good beef on their tables get it via Hong Kong from Shanghai. The cattle of Northern China are better than those of Southern China; and those of Japan being better than any in China.

Butter is unknown in this part of China, except as imported from Europe and America for foreigners' use.

CHARLES SEYMOUR,
Consul.

UNITED STATES CONSULATE,
Canton, November 7, 1883.

AFRICA.

CATTLE IN CAPE COLONY.

REPORT BY CONSUL SILBE, OF CAPE TOWN.

Since receiving Department circular, dated July 18, 1883, containing instructions to report on the cattle industry of this colony, I have constantly used every endeavor to obtain the necessary data for such a report, but regret to have to state that my endeavors have not been connected with any flattering degree of success.

As a matter of fact, there has been little effort in this colony to improve upon the breed of cattle found in the possession of the Hottentots by the earliest settlers of the country.

This breed of cattle at this day is known among colonists as the Africander breed. By far the larger part of the cattle of South Africa belong to this variety.

With the view of obtaining the necessary information for compiling an intelligent report on this subject, I sent to several of the leading stock farmers the principal interrogatories contained in your circular. From some I have received no reply whatever; while others have responded, but, as a rule, with the confession that they possessed little or no knowledge of the subject in question. One prominent stock-dealer writes:

Regarding the information required by you with reference to the different breeds of Cape cattle, I regret that after keeping you waiting so long, and after thoroughly going into the matter, I should find it impossible to oblige you. At a glance it seemed the easiest thing imaginable, but on giving it a little thought I saw more and more the difficulty of carrying out my promise. I therefore went to several fellow cattle-dealers for assistance, and they expressed the same want of information which I experienced. We all agree, however, that the Africander is the only breed kept pure in the country. For information about that breed I went to our principal or rather largest meat merchants here, who could not give me the average weight of an Africander ox.

Another cattle farmer writes:

I have looked over the papers you sent, and think, after all, the mixture of cattle is so great in this country that it would be useless to attempt a report. The only breed we have pure is the Africander, and you had better send to the Free State for information.

Still another prominent cattle farmer writes:

To get the information requested upon the cattle industry, I regret to say, will take up too much of my time, and then I am afraid it will not be of much value, as the herds are not kept pure, being crossed and recrossed to such an extent that they cannot be classed.

Notwithstanding the discouraging tone of the above, my own observation, coupled with frequent interviews with Richard H. Stockdale, esq., of Wynberg, I have been enabled to gather a few facts which may not be uninteresting to the Department. The Africander breed are of moderate height, long in the leg, flat-ribbed, and require good pasturage to keep them in condition. In appearance some of the best specimens resemble the Devon, the horns being longer, and red being the prevalent color.

For light-draft on fair roads they answer tolerably well, being very fleet of foot.

The cows for milking purposes are all but worthless, giving but a small quantity of milk, though of good quality. In the best pastures they fatten tolerably well, but on dry, hard food readily succumb to hardship. Friesland bulls have been used in crossing, and have proved successful in improving the milking qualities of the cows, as well as better oxen for draft for heavy roads. It is a common practice among the farmers of the country, after using Friesland blood for some generations in their herds, to again have recourse to an Africander bull, in the belief that this strengthens the constitutions of the animals. This process naturally leads to no advance in the direction of any distinct breed. In some instances Shorthorns from England have been tried, but have not met with much favor.

In the vicinity of Cape Town the best-bred cattle are to be met with for dairy purposes. Kerry bulls have been put to half-breed Dutch cows, giving compact, handy little cattle. Jerseys for the same purpose have also met with some favor. Herefords have had but a limited trial in this colony, but so far have given great satisfaction in pulling through drought on dry food while other animals succumbed.

By some farmers it is thought that this and the Devon are the breeds best suited for the requirements of this country.

The average weight of a decent-sized ox of the Africander breed is about 600 pounds dead weight.

There is great and ample room for improvement in the cattle industry of this country, but such can only come as greater care is used by farmers in segregating their herds; as at present, through carelessness in the castration of young stock, the progeny must necessarily be much mixed.

According to the census of this colony taken in 1865, there were 692,514 cattle; in 1875, 1,111,713. At this ratio of increase the number of cattle now in the colony would approximate something like 1,778,000 head; to this number may added about 265,000 head in British Basuto land and Transkeian territories which were not included in the census, making an aggregate of 2,143,000 head of cattle in the colony.

The average value of a sound matured work-ox is about $50.

Milch cows vary in prices from $30 to $100, according to age and their milk-giving qualities.

IMPORTS OF DAIRY PRODUCTS.

Little or no interest is bestowed upon dairy business in the colony except in the neighborhood of towns. The majority of cattle farmers are the greater part of the year without milk or butter so far as any product from their own herds are concerned. For dairy products the colony is almost wholly dependent upon foreign countries.

Last year there were imported for the use of this colony 1,424,750 pounds of butter, and valued at £97,689; and 1,099,440 pounds of cheese, valued at £37,850. With little care and foresight this enormous expenditure could be saved to the colony.

No cattle are exported from this colony except coastwise and to the garrisons at St. Helena and Ascension.

JAMES W. SILER,
Consul.

UNITED STATES CONSULATE,
Cape Town, May 10, 1884.

CATTLE IN SIERRA LEONE.

In reply to the circular just received from the Department of State (July 18) regarding *breeding cattle*, I beg to submit the following:

SIERRA LEONE CATTLE.

The cattle found in this country are not raised with any care whatever, and no attention is given to improving the stock. They are all of the common or scrub kind, of small stature, about the size of an ordinary two-year-old, and the cows are seldom or never kept for milk. Cow's milk is an almost unheard-of thing here; the only fresh milk, which perhaps is about 1 per cent. of the total used, is from the goat. Condensed milk in tins is the kind in general use, and to make any butter or cheese is never thought of.

HOUSING AND FEEDING.

There is no housing or artificial feeding of cattle in Sierra Leone; the climate being warm the year round they pick up their living wherever they can, and there is no pains whatever taken in breeding.

There are no cultivated grasses. Cattle are brought to town in canoes by the natives and sold to butchers and dealers and killed for the beef and hides.

PRICES OF BEEF AND CATTLE.

The beef is very tasteless and dry and is sold daily in the market at about 5 pence per pound.

The price of a live bullock is from £2 to £5, according to size. They weigh alive (I should judge) from 250 to 500 pounds. Color, mostly red or cream-yellow. Small horns.

EXPORT OF HIDES TO THE UNITED STATES.

There have been shipped from this port to the United States during the year 1883 to the present time (October 27), 66,938 dry hides; it is probable that 15,000 more will be shipped ere the close of the year, making a total of 81,938. This, no doubt, includes very nearly all the cattle killed in all this surrounding country which has any trade with this port.

The average weight of what are classed as good hides is 10 pounds each when dry, and they are bought by the merchants, who ship them to the United States at 6½ pence per pound for good hides, half price for "culls."

The mean temperature of this country is about 80° throughout the year.

The soil is loam and sand, with, in many places, a substratum of granite.

The surface stone is largely iron-stone, and is used extensively in building.

JUDSON A. LEWIS,
Consul.

UNITED STATES CONSULATE,
Sierra Leone, October 27, 1883.

CATTLE IN MOROCCO.

In a country where, like this, there is no means of getting proper statistics, it becomes difficult to give an exact and reliable report; still, on the whole, the breed are very inferior, owing to the neglect of breeders, and consequently totally unfit for the purposes suggested. On the contrary, if anything, the breeders require much improving by importation of other classes, and even that would give but doubtful results, cattle having, as a rule, to live upon the chances of abundance or scarcity of wild pasture, as the owners adopt no other means of keeping the stock in good condition.

FELIX A. MATHEWS,
Consul.

UNITED STATES CONSULATE,
Tangier, January 3, 1884.

GENERAL STATISTICS.

The cattle are called Moorish, but appear to be a cross-breed between Spanish and Algerian. They give an annual average production of 6 pounds of milk per day. From 12 to 15 pounds of milk are required for 1 pound of butter, and from 3 to 4 pounds of milk to 1 pound of cheese. At maturity the cow measures from 3 to 3½ feet, the bull from 4 to 4½ feet, and the ox from 4 to 4½ feet. The live weight of the cow, 2½ to 3 cwt.; of the bull, 3 to 5 cwts.; of the ox, 3 to 4 cwts. They mature at three years. The weight of meat at maturity is from 4 to 4½ cwts. The color is red, brown, and brindled black. They are Longhorn, same as Spanish. It is uncertain how long they have been bred pure. The origin of the breed is untraceable. Their labor is equal to one horse-power. The product of meat is about 300 cwts.; of milk, 1½ quarts per day. Very little cheese is made; it is imperfect and inferior.

The country is generally undulating; grazing country averaging from 50 to 300 feet above sea-level. The mean temperature is about 65°; in summer, 80° F.; in winter, 56° F.

The soil is generally alluvial in the Tangier district; loam, slight; clay, slight in the vicinity of Tangier. Sandy soil predominates in the vicinity of Tangier.

The substratum is a little limestone, a great deal of sandstone, not much granite, partly clay; gravel, &c., predominates.

There are no cultivated grasses.

There are no methods of housing. The feeding is grass and barley. The breeding is promiscuous. The products are handled in the most primitive manner.

CATTLE IN ZANZIBAR.

I have the honor to acknowledge the receipt of the circular from the Department regarding breeds of cattle, &c., and in reply I would say that it is impossible to fill out the questions asked, as there are no particular breeds of cattle in this vicinity, and what there are mostly resemble stunted buffaloes.

F. M. CHENEY,
Consul.

UNITED STATES CONSULATE,
Zanzibar, November 26, 1883.

MISCELLANEOUS.

CATTLE IN THE PHILIPPINE ISLANDS.

There is no cattle-breeding of any consequence whatever in the Philippines, only a few cattle being kept for draft purposes, while in all other respects buffaloes, a similar breed to the regular black African kind, are universally employed for farming and hauling. These also furnish the milk in use hereabouts; consequently there are no dairy products of any description. Sheep do not thrive here, and are sparingly imported from China for our butchers.

JULIUS G. VOIGT,
Commercial Agent.

U. S. COMMERCIAL AGENCY,
Manila, December 15, 1883.

CATTLE IN MAURITIUS.

I have the honor to acknowledge the receipt of circular bearing date July 18, 1883; also the memoranda accompanying the same, relating to the breeding of cattle in Mauritius.

In reply I have to state that the information required is not applicable to this island.

We have a few cows from France and the Cape of Good Hope, and the native breed is a cross between the two.

Beef for consumption is imported from Madagascar.

THOMAS T. PRENTIS,
Consul.

UNITED STATES CONSULATE,
Port Louis, Mauritius, December 17, 1883.

CATTLE IN THE SEYCHELLES ISLANDS.

I have the honor to acknowledge the receipt of circular bearing date of July 18, 1883, inviting a report on the domesticated animals of the country to which I am accredited. I beg respectfully to inform the Department that the cattle of Seychelles number barely three hundred, and that they are descendents of the wild African hump-backed cattle. These animals are very small and are comparatively worthless for either milk or beef. Four or five quarts of milk per day is a fair average of the quantity given by the better animals. No butter or cheese is made here. The beef is hard, stringy, and tasteless, and the fresh meat supply of Seychelles is augmented by importations of bullocks from the eastern coast of Madagascar. No statistics in regard to the domesticated ani-

mals which obtain here can be procured except as regards the number. Cattle are bred only for the private use of the breeder, and no great increase or decrease of stock could be expected in a country where pasturage is so limited as it is here and where the dairy is unknown.

EVELYN P. MUSSEY.

UNITED STATES CONSULATE,
Mahé, November 26, 1883.

SPECIAL STATISTICS RELATING TO THE SEYCHELLES.

Topography.—Altitude, sea-level; temperature, mean, 80° F.; summer, 83°; winter, 75°; soil, clay and sand; substratum, clay.

Cattle statistics.—African breed; annual yield of milk 1,500 pounds; live weight of cattle, cow, 300 pounds; bull, 400 pounds; age at maturity, three years; weight of meat at maturity, 200 pounds; never housed; fed on coarse grass and cocoa-nut residium.

SUPPLEMENT

TO

REPORTS FROM THE CONSULS OF THE UNITED STATES ON CATTLE BREEDING, DAIRY FARMING, AND THE MARKETS FOR CATTLE AND CATTLE PRODUCTS, IN THEIR SEVERAL DISTRICTS, IN ANSWER TO A CIRCULAR FROM THE DEPARTMENT OF STATE.

SUPPLEMENT.

AMERICAN VS. DANISH AND FRENCH BUTTER IN CEYLON*.

* * * * * * *

There was an importation of butter here direct from the United States, which was largely advertised to be offered on arrival at a price which, if the article were good, would insure a rapid sale. Unfortunately it proved to be salted butter in tins, and the condition was not excellent; not, in my opinion, from any fault in the butter itself, which in color and consistency appeared to me quite perfect, but from a strong alkaline flavor pervading the mass, rendering slightly offensive that which otherwise might have been pure and wholesome food.

I have satisfied myself that the whole mistake about the butter was, first, in salting it at all; secondly, in the use of impure salt, say that which had not been completely cleansed of the several sulphates and oxides which ordinary culinary salt is known to contain; thirdly, that the tin cans were of an inferior quality of tin plate, which therefore lent its impurities all the more readily to the corrosive action of the not very pure salt.

Some people here will not accept this theory, but believe that the butter was of poor quality when packed. I think differently and regret this circumstance, which must in a measure bring American butter into discredit in a place where I have often extolled its purity and goodness, and where it unquestionably may find a profitable market if exhibited to the customers in anything like its native excellence; and I would advise our producers and packers who propose preparing canned goods for export to employ as little salt as possible, and to be sure that whatever of that article is used is pure; also to make their cans of the very best tin plate and solder that are manufactured.

I inclose duplicate samples of the tin containing the American butter above mentioned; also, samples cut from a Danish butter tin, the difference in quality being very noticeable; and would add that whereas the Danish butter sells rapidly for 65 cents per pound, the American sells slowly for 45 cents.

The French are sending to the Orient large quantities of butter, in 1 and 2 pound bottles, with mouths about 2 inches in diameter, glass stoppered, and secured with hard white cement, so as to be perfectly air-tight. The butter is fresh, but, after being packed, about one tablespoonful of white pearly salt, almost impalpably fine, and exquisitely pure, is put into the neck of the bottle, and the stopper secured. This butter retails almost unlimitably at 65 cents, gold, per 1-pound bottle, and at 55 cents per pound in 2-pound bottles. As our country has now become famous for its excellent glass, and there can be no question about the conservation of butter in vessels formed of that material, I see no reason why our exporters should not pack their butter after the French style, also their cheese, and thereby secure the preservative qualities of these two great articles of universal consumption, as well as a never failing market in the Oriental hemisphere.

CHEESE AND BUTTER MAKING IN ITALY.

REPORT BY CONSUL CRAIN, OF MILAN.†

The Italians devote themselves to the rural arts with Virgilian enthusiasm. The plains of Lombardy are cultivated with the care bestowed on garden plots in other

* Extract from a report by Consul Morey, of Colombo, Ceylon, published in No. 4 of the Consular publications.

† Republished from Consular Reports No. 10, for August, 1881.

countries. Cattle improvement is a study of the Italian farmer. Care, skill, and science are used in the preparation and manipulation of the products of the dairy. Italian butter and cheese, though expensive, are used on every continent; and such is their excellence that, despite that strange but universal fancy for foreign articles, Italians prefer them.

A successful imitation of Italian cheese in the United States would enable our dairymen to supply the demand for it in our country, and export it to those lands where it is used. As the cost of production is but slightly more than that of American cheese, the justly high price that it commands would make its manufacture profitable. The practicability of imitation is shown by the recent successful copying of Swiss cheese in our country; its utility by the large exportation of these imitations. I will minutely describe, from observation and official data, Italian cheese-making processes to enable the cheese-makers of the Mohawk Valley and other dairying districts of our country to produce it in their factories.

Milk foods.—The Piedmontese make butter and many kinds of cheese, of which *gruyera fontina, rubiole, grana,* and *stracchino* are the best. *Gruyera* and *fontina* are made from the Estival pasturage of the valley d'Aosta. *Rubiole* are small sheep's milk cheeses of Alba, Mondovi, and Acqui, whence they are considerably exported. *Grana* and *stracchino* are Novarese products. The former is made during ten months of the year; the latter in October and November. The mode of preparing them is being improved; but the increased price of butter induces its extensive manufacture to their detriment.

A large quantity of excellent butter, *grana,* and *stracchino* is made in Southern Lombardy and Mortara. Lecco, Varese, Bergamo, and Breschia produce good *stracchino* and butter. Delicious cheeses, called "*formaggini,*" are made on the rich pasture of the Valtellina hills.

Inferior butter and cheese are made in Mantua. Lodi, Pavia, and Milan, which produce 24,000,000 pounds of butter and 60,280,000 pounds of cheese, are the best dairying districts of Lombardy. The cheese of Venetian factories is poor, but the butter of the mountains of Caprio, Basano, and Valdagno is justly famous.

In Asiago there are 85 creameries and cheese factories, employing 300 hands, and annually producing 33,400 pounds of cheese and 37,400 of butter.

The dairying interest in Liguria is small. The Emelian plain, between the Panaro on the east and the Tribbia on the west, is, with Lower Lombardy, the center of Italian cheese and butter making.

There are 35 factories with 50 cows apiece in the Piacenza district, annually producing 286,000 pounds of *grana* and 124,000 pounds of butter. Owners of two or three cows send their milk to these factories for working.

Dairying is the chief rural industry of the Paremesians. Their *grana* (called "*parmigiano*") is sent to our country. The 129 "*casselli,*" or establishments where it is made, are scattered on the plain and on the hills, and have 184 caldrons for the boiling of milk, and 130 churns for butter making. In their production of 1,650,000 pounds of butter and cheese, they consume 9,000,000 quarts of milk. The working season is from April to November, though 20 "*casselli*" are open all the year.

The Emelian cheese keeps well, is improved by age, and much used as a relish with meats. It is made as in Lombardy, but because the cream is only removed from one milking, the percentage of poor cheese is less. In Umbria and the Marshes they make a considerable quantity of cheese of sheep's and goat's milk, and a little of cow's milk. That made on the mountains of Visso, in the Camerino district, is excellent and celebrated.

The small Marcerata region produced alone, according to the last report, 160,000 pounds of cheese per year. It has but few cows, and those of Tuscan and Swiss stock. They give, on an average, from 11 to 13 quarts per day. In some factories cheese is made of sheep's, goat's and cow's milk mixed. Cheese of the first kind is extensively exported and sells, where produced, at 15 and 20 cents per pound. It obtained prizes at Florence, London, and Paris. Its excellence is due to the healthy and aromatic plants which abound on the Marcerata hills. From sheep's milk the Spoletese produce annually about 770,000 pounds of cheese. One of their factories makes yearly, from the milk of 70 choice Swiss cows, 23,000 pounds of cheese and 2,000 of butter. The sheep's-milk cheese, called "*crete,*" of Siena, Tuscany, is well known and good. It bears a distinctive name, but is not made by special process. It is prepared by peasants, without system, and in small lots. Factories for its scientific manufacture have been recently erected. Little cheese is made in Lazio, owing to the scarcity of sheep and the poor quality of the milch cows.

The sweet cheeses of the southern Adriatic provinces of Italy, called "*marzoline,*" are said to be delicious, and equal to any produced elsewhere.

A Government committee reported some years ago that their excellence was due to rich milk; that old modes of cheese making were followed; that dairying, including utensils, milking, quality and quantity of rennet for coagulating, cheese making, salting, and pre-

serving was intrusted to empirics; and that to judge, *a priori* it was sufficient to glance at the wretched dairies surrounded with dirt and permeated with odors. Molise produces 27,000 pounds of cheese per year, and Terra d'Oltranto 35,000 pounds, or one-third more than in 1870.

Among the Southern Mediterranean provinces Catanzaro is famous for its butter; Caserta for a peculiar cheese called "*mozzarelle*," and Potenza for excellent sheep's-milk cheese. The Casertese make 22,000 pounds yearly, and 26,000 pounds are made in Benevento. The cows of the Modica district of Sicily are large milkers, and the pasturage is so rich that their milk contains fine butter and cheese-making properties. The cheese produced is equal to that of Parma, Lodi, England, or Holland. Cows stabled give from 20 to 22, and many from 30 to 38 quarts daily. They do not give milk in winter or at other times when the food is scarce. Sicilian sheep give 1 and goats 2 quarts per day.

In Sardinia two kinds of cheese are made, viz: that of cows' and that of sheep's milk. Of the latter kind about one-third, or 300,000 pounds, is exported. The Sardinians also produce a large quantity of butter.

Modes of making.—In making Piedmontese cheese the milk is used when tepid. It is mixed and shaken in whey, which curdles it in one-quarter of an hour.

The curd is shaken for drainage, and when dry pressed in a form. Sometimes this cheese is made of partly skimmed milk.

Stracchino, of Gorgonzola, is made of milk containing the buttery parts. When the mountain pasturage is exhausted the Berganese herdsmen drive, for wintering, their herds to the plains. Gorgonzola is their favorite halting spot, for there they first find the luxuriant vegetation of the Lombardian plateau. These herds reveling on the rich grasses of Gorgonzola are, from the middle of September to the end of October, very lactiferous.

Cheese is made during these months in small rooms devoted to it in the homes of the Gorgonzolese, who buy the milk of the herdsmen. The autumn temperature, being moderate, is best for cheese making, as too much heat, by hastening the separation of the whey, makes it too dry and friable, while excessive cold produces a wheyey acid, and easily-spoiled cheese.

The milk while warm from the cow is curdled with well-preserved and prepared calf rennet. The quality of the cheese depends much upon that of the rennet; and experience guides as to the quantity required. In fifteen or twenty minutes, when the milk is coagulated and the whey separated, the curd is hung in hemp-cloth bags to drain. As cows are milked twice daily the foregoing is twice done, viz: mornings and evenings.

The morning-drained curd, inclosed in light, flexible, wooden bands, covered on their inside surface with hemp cloth, is placed on an inclined board strewn with rye chaff. Being of two milkings the curd is partly warm, partly cold, and, though mixed, care is taken to form the upper and lower strata of the warm, because it is cementitious. As hot and cold curd never perfectly unite, minute interstices remain in the cheese, in which, while maturing, green mold, known as "parsley," forms and gives the *stracchino* the delicious taste for which it is famous.

The curd is further drained during the first day of the process by two or three turnings. On the following morning, when of some consistency, the cloth being removed, its value is determined by weighing. After three or four days fermentation begins, and the wooden bands are removed. It is then, once daily for eight or ten days, alternately salted on its upper and lower side, 4 ounces of pulverized salt being, on an average, used per form, or 33 pounds. The Gorgonzolese adopted some years ago the process of quickly turning and pressing the cheese against a salt-covered surface, thus insuring more uniformity and a better crust.

The color changes in a month to pinkish-white, if good; to black, if bad. When black the crust is soft and the cheese perishable in summer. If the crust is sufficiently hard the shade is improved by one or two dippings in salt water.

The time of maturity depends upon the temperature (which is best from 10° to 15° Centigrade), manner of making, and quality of the milk. The Gorgonzolese *stracchino* begins to ripen in April, and continues till September. One hundred quarts of milk make about 25 pounds of this cheese.

Belluness cheese is made by heating the milk, pouring in rennet, letting it coagulate, breaking it into medium-sized pieces, reheating it, putting it in wooden tubs, salting and placing it on stands for daily turning, and resalting until consumed.

The following process makes a kind of Frinlani cheese known as "*fleno*:" Milk heated until tepid in caldrons is mixed with rennet and left to curdle. The curd is broken in vessels into small pieces, and violently shaken over the fire. When thus crumbled, the caldron being set on a stand, it is gathered, thrown into the "talcio" or forming-tub, placed on tables for drainage, dried, and finally immerged in brine.

Other Frinlani cheese is made with milk tepified in heaters and thence poured into wooden vats for coagulation. The curd formed is wet, broken into large lumps, remoist-

ened with hot whey or water, gathered, and pressed in wooden hoops. It is less solid than that next before described.

Formaggio di Grana.—Milk is poured into caldrons and placed on the fire. If mature, *i. e.*, bluish (as it should be in summer), it is warmed to the twenty-fifth degree; if sound, *i. e.*, retaining the whiteness and sweet taste of freshly milked, it is heated to the thirtieth degree. At this temperature, as tested by the hand, it is removed from the fire and mixed with rennet. One-sixth of an ounce of rennet is used per 720 quarts of milk. The rennet is dissolved with a pestle in wooden cups, filtered through horse-hair sieves, the oozing going into the caldron of milk. To prevent hardness the curd formed is broken and turned with the cream-turner, *rotilla* (or stick with wooden disk at end), and *spino* (or cane with twisted twigs or iron pins at one extremity). This is continued for three quarters of an hour, while concretions appearing on the surface are removed by hand.

Turning is stopped for two or three minute intervals to consolidate but not harden the now softened or dissolved curd. The whey is removed and one-sixth of an ounce of saffron, per 110 quarts of milk, thrown into the caldron. The curd is replaced and left for one hour on the fire, heated to the forty-fifth degree (but not higher), and continually stirred with the *rotilla*.

A cup is filled with curd for examination as to the minuteness of its particles. If small enough the caldron is removed, and the curd sinks and forms on its bottom. To hasten this the cooled whey (before drained off to enable the adding of saffron) is poured into the caldron, the bottom of which is pressed with the *rotilla* to unite and incorporate the curd. The curd is loosed with a stick from the sides of the caldron, lifted, drawn on the surface, collected in a cloth, placed and left for one hour in a vat, and there wet with whey. It is marked with the name of the owner of that day's cheese, pressed for drainage by hand in a box of narrow beech boards bound with hoops and packthread and covered with linen, a wooden disk, and a heavy stone. When dried these coverings are removed and it is rewet with whey, and then covered with buckram, which, under pressure of the disk and stone, makes reticulated imprints on its circular surface. After some hours the buckram is cut, and the clippings removed to permit the whey to dry in. It is covered and rubbed on an oak bench with salt, dipped in salt water, and repressed between the beech boards. Sometimes several forms are simultaneously pressed to improve the under by the salt moisture from the upper. It is resalted every other day for two weeks, then put in the cheese-house, where superfluous salt is removed by scraping. In September it is rubbed with cheap oil.

The cows of the numerous dairies of Puglia and Basilicata are milked once daily. Their milk, when poured into large vats, is divided and half heated to a point which will make it and the unheated mixed, when tested by the hand, 30° Reaumur. Whey of goat's milk is mixed and shaken in it. While curdling it is covered with a cloth to keep up the temperature. When curdled it is broken, stirred with the *rotolo* till in filbert-sized pieces, placed with whey in a vat, rebeaten, wet, and covered with warm whey to "grow."

When by heating on hot coals or boiling in water ductility is obtained, the curd is called "*crescuita*," or grown. This property acquired, it is cut, the pieces thrown into the pail, where they are wet with hot water, reunited, manipulated, pulled into thread, and made into as many balls as there are cheeses to be made. These thread balls are immersed in the water which served to make them, manipulated till homogeneous and compact, formed by hand into proper shapes, and daily salted for two or three days. Cheese thus made is called "*caciocavallo di Puglia.*"

The *caciocavallo* of Calabria is a cows' milk product, prepared by slight modifications of the usual cheese-making process. Upon coagulation turn the resultant mass, and gather, after due heating, the caseine. Form it, by stirring and pressure, into uniform and consistent paste; subject this, in vats, to the action of hot whey; thence remove it to tables for working, where, arranged in orbicular forms and covered with cloth, leave it to the chemical action of its constituent parts. During this time, when fermentation begins, it is cut in slices, which are immersed and shaken in hot water, manipulated to drain off the whey, &c., reduced by water and heat to homogeneity, replaced on tables and rendered soft, adhesive, and ductile by frequent dipping and turning in cold water. In this state it is divided, shaped in oval forms, kept the first day in cold water to produce elasticity and consistency; the next, in salt. Thus finished, it is fastened to the end of a stick, and hung from the beam of the cheese-house.

Cows' milk, when coagulated and lightly broken, produces a semi-solid excretion or discharge, which forms the essential substance of *rasco* cheese. This is placed in vats, lightly shaken; dipped quickly three or four times in hot whey, removed, and replaced when sufficiently solid, upside down, in these vats; then kept for twenty-four hours, slightly salted and taken to cool, dry rooms for keeping. This cheese is made from June to October, the season when the milk is most buttery. It is soft, white, and soluble at a low degree of heat.

Sicilian *caciocavallo* is made of cows' or goats' milk, and coagulated like sheep's milk cheeses. When curdled it is not heated in water but broken with a piece of wood, the whey removed, dried, and taken from the tub to the trough. Then the curd is sliced, replaced in the tub, cooked in boiling whey, removed to the trough, pressed to solidity, cooled, placed and left for twenty-four hours on a stand or table, sliced, thrown into boiling whey, recooked till viscid, gathered, pressed, drawn by hand, reduced to paste, formed in pumpkin-shaped pieces, salted for twenty-four hours, and hung, prepared for use, in the cheese-house.

Proratura cheese is made of cows' milk. The cows are only milked mornings, when their milk is poured into a large pine, tub-shaped receptacle. Only when the atmosphere is cold is it previously slightly heated. Dissolved kid rennet is poured into it, the mixture turned with the *rotolo*, and then left quiet. Upon coagulation the curd is not allowed to become lumpy, but is pressed and softened with the *rotolo*. When the curd sinks in the vat a sieve of pierced tin is placed and held over it with weights. If much whey rises it is used for *ricotta;* if little, the sieve is removed, and it is left on the curd to facilitate "growth," as before defined. When ductile it is cut in small pieces, placed in another pine vat, and previously prepared hot water poured upon it. Here the curd is kept till cooked, when the water is drawn off. It is then, in portions, gathered, and stirred with a wooden spoon, and formed, by hand previously wet in cold water, into two-pound balls, which are put, and left for some hours, in tubs of cold water, and finally slightly salted.

BUTTER-MAKING IN ITALY.

Butter, when made in families who have little milk, is made in cylindrical churns, in which the cream is shaken by movement of the churn-handle. Factories use large cylindrical churns on trestles, in which are wings turned by machinery. The butter they produce is cleaner than that made by hand-churns.

In Pavia, cream of 6° or 7° R. is shaken in round boxes called "*puraggie.*" Each box has a spoon fastened to an axle. This axle is turned by a crank, and revolves the spoon around the inside periphery of the box. The process requires two men. Some use a cradle-churn, which saves labor and produces equally good butter. In Cremona the American machine is in general use, namely, a horizontally fastened tub, in the interior of which is a reel similar to that used in silk-making.

The dairyman of Parma beats the milk with a cream-whipper, and skillfully lets the floating cream, which gathers in the bucket, overflow into a fine-edged wooden bowl, and thence into the churn. In summer it is customary to add 10 pounds of ice to every 30 quarts of cream, while in winter some cream is heated and turned into the churn with the rest. The temperature is always kept from 10° to 15° Reaumur. When in the churn two men alternately beat the cream with a butter-beater joined to a straining-frame, raising and lowering it by leverage. Butter should begin to form in three-quarters of an hour. When it is necessary to hasten formation, water is added—where advisable to retard it, ice. If made before the time mentioned, it is soft—if after, hard and set. When prepared it is taken from the churn, worked with the hands, formed into blocks, and left to drain. The blocks are frequently adorned with impressions made with a wooden stamp. The skimmed milk is used for the *ricotta* cheese.

In Catanzaro butter is made with the old-fashioned churn, a miserable mechanism, causing loss of milk and time. The manner of keeping butter there, though simple, is exceedingly ingenious, consisting in inclosing it in small bladders, in which it can be conveniently kept and carried without danger of change.

At Modica, where the butter is delicious, it is not made directly from the cream, but from the "*ricotta,*" which is obtained by boiling the small milk after extracting the cascine.

The butter-maker of Sardinia puts the "*ricotta*" in a bowl of cold water, and shakes and presses it between his fingers. In a half hour a white scum appears on the surface of the water, and by continued movement and pressure of the "*ricotta*" increases during the succeeding half hour. This scum is the butter of the "*ricotta.*"

Dairy associations and cheese factories.—It is hard to determine the epoch in which the first dairy associations were formed. It is known that they were numerous in Savoy in the Middle Ages, and that they have existed since remote times in the French Jura and on the Alpine slopes. Where land is owned in small plots, as in the mountainous parts of Upper Italy, and where large dairies, consequently, do not exist, the making of cheese is impossible, unless assumed by a manufacturer who would buy the milk from the cow-owners, or unless these, in partnership, prepare it.

The advantages of dairy associations and cheese factories are numerous. One cheese-making establishment, set of machines, and utensils answer for many milk-owners, lessen the cost of production, increase and improve the product, facilitate sales, save

time, and permit farmers and their workmen to be otherwise usefully employed. These considerations moved the Italian Government to offer, in 1873 and 1874, several prizes, of which the highest was $240 and a gold medal, to the best managed association, under articles of copartnership, organized for the manufacture and sale of butter and cheese, or either, to be thereafter started, composed of at least ten associates having equal rights, working 340 quarts of milk per day, and having a cheese-maker in their sole employ.

Since then cheese factories have greatly increased in number and improved in management. They are everywhere in Italy except Sicily, where small milk-owners carry their milk to the large, and when, after a month, they have delivered to these 250 or 300 quarts, they receive that quantity back at one time. This system of reciprocal loans is mutually beneficial, as a large quantity of milk worked at one time makes more cheese than the same amount worked in small quantities at different times.

I trust, sir, that my suggestion of imitating Italian cheese will commend itself, and inure to the benefit of our dairymen; for while it is a proud thing for a people to teach, the secret of national prosperity consists in having the manliness to learn.

THOS. C. T. CRAIN,
Consul.

UNITED STATES CONSULATE,
Milan, May 31, 1881.

THE MANUFACTURE OF SWISS CHEESE.*

REPORT BY CONSUL ADAMS, OF GENEVA.

The manufacture of cheese is one of the most ancient industries of Switzerland, instruments for this purpose having been found in different parts of the country among the ruins of the "lake dwellings," whose date is anterior to all historical records. In the fourteenth and fifteenth centuries the production had grown large enough to become the subject of legislation, as appears from some curious decrees of Berne, Glaris, Appenzell, and other countries, prescribing the form and weight of the cheeses, and forbidding the manufacture of certain sorts or any exportation to foreign countries. At the end of the last century the methods of manufacture were of the rude kind still in use among the mountains and in the remote districts, each household making what it needed without any special conveniences or skilled processes. The modern manufacture dates from the introduction, 80 or 90 years ago, of the cultivation of artificial fodder (*fourrages artificiels*), and the system of stabling cattle, now universal in the lower valleys and the plains. The improvement of quality created a wider demand at home and a new market in other countries, and to-day the better kinds of Swiss cheese are as much a product of skill and high art as the Swiss watch.

The several varieties are classified either according to consistency of material, as *dur, ferme*, and *mou* (hard, firm, and soft), or, according to the proportion of fatty matter, as *gras, mi-gras*, or *maigre* (rich, medium, or thin), or, according to the coagulation, whether by rennet (*à présure*) or by sour milk (*à lait aigre*). Table A gives a description of the better-known varieties according to the qualities indicated, and Table B an analysis of selected specimens of some of the same varieties. With the exception of the *Vacherin* (*Mont d'Or*), which originated in France, and the Urseren from Italy, and a few imitations of foreign styles like the Limburg, all the kinds named here are native and peculiar to Switzerland.

The best and the most abundant of the Swiss cheeses is the *Emmenthal*, a round cheese, 80 to 100 centimeters in diameter, 10 to 15 centimeters thick, and weighing from 50 to 100 kilos or more. Like all the rich cheeses (*fromage gras*), which retain nearly all the elements of the milk, its nutritive value is high. It was first made in the valley of the Emme in the canton of Berne, whence it followed the Bernese emigration into the neighboring cantons, where it is now made in large quantities, and into Bavaria, Russia, North Germany, and North and South America. The exportation began in the last century to Germany and Italy, and now it is sent everywhere, the principal markets being Germany, Russia, Italy, and the United States, where, I believe, it is known as *schweizer käse*. In winter a good deal of Emmenthal *maigras* is made, mostly for France, where it takes the place of butter.

Next in importance is the Gruyère, called after the village of that name in Fribourg, another round cheese 60 to 70 centimeters in diameter, 9 to 12 centimeters thick, weighing 30 to 45 kilos. It has come into great repute within the last ten years, since the

*Republished from Consular Report No. 15, for January, 1882.

formation of a wealthy society for its manufacture in Fribourg. It is also made in large quantities in Vaud and Neufchatel, and the French provinces of the Jura and the Doubs, where according to some writers it originated about 1750. It is manufactured in much the same way as the Emmenthal, except that a third or more of the cream is removed, whence it is classed as mi-gras. The exportation is mostly to France, Italy, and recently to South America.

The Spalen, so called from the manner of packing for shipment, is a cheese mi-gras, 45 to 55 centimeters in diameter, 8 to 10 centimeters thick, weighing 18 to 23 kilos, and made in a much ruder manner than the Emmenthal and Gruyère. It comes from Unterwalden, Uri, Schwyz, Lucerne, and the Burnese, Oberland, and is sent to Italy, where it is used grated (fromage dur à raper) with macaroni, rice, polenta, &c. It comes to perfection in two or three years. Another variety made for the Italian market is the Urseren, which comes from the higher pastures of the valley of that name. It resembles the cheeses of Northern Italy, as does the *Formaggio della paglia*, and the *Battelmatt*, both produced in the canton of Tessin. Most of these varieties are disagreeable to a palate unaccustomed to them.

The cheese of the canton of Appenzell, long famous for its fine cattle and excellent fodder, differs in certain qualities from all the other Swiss varieties. In making it the curd is triturated in a brassoir, molded without pressure or salting, and finally treated with a brine of water, wine, lees of white wine, pepper, and salt, which gives it a pungent odor and flavor, something between the Swedish and Italian cheeses. The exact formula for the brine is supposed to be a secret, and, as with most of the Swiss cheeses, the processes of manufacture is only to be learned in its own country, where the traditional methods have been handed down for generations. The Appenzell is a cheese 25 to 30 centimeters in diameter, 12 to 15 centimeters thick, weighing 7 or 8 kilos, and is exported to all neighboring countries, but mostly to Suabia.

Still more remarkable is the *Schnabziger*, or green cheese (*fromage vert*), known, I believe, in the United States, under the corrupt name of sago or sapsago, and which some writers hesitate to class as a cheese. Its manufacture dates back to the ninth or tenth century, and it is still the most famous product of the canton of Glaris, which turns out a great many other varieties, mostly *mi-gras* and *maigre*. The peculiarity of the Schnabziger is due partly to the method of coagulation by azi instead of rennet, and partly to treatment by the *zigerlee* (melilotus cœrulea), a plant grown for the purpose in Schwyz. In 1869 the exportation amounted to 1,250,000 kilos, valued at 750,000 francs. It is sent all over the world.

The foregoing are all export cheeses, principally consumed out of the country. The variety manufactured for home consumption is endless. Some of them are of great excellence, but will not bear transportation. The following may be recommended to the attention of importers in the United States:

The *Gessenay*, made in the high pastures about the village of that name in Berne and elsewhere in the Oberland. It is a cream cheese (*gras*) of fine aromatic flavor, very hard, and keeping well for many years. Its nutritive value is high, and it should be used like the spalen or parmesan, grated with soup, macaroni, &c. A similar cheese is made in the canton of Valais. This is perhaps the richest of all the Swiss varieties, and has a peculiar flavor of its own. The process of manufacture has greatly improved since 1872. Less durable but equally nutritious and palatable, and of the same general character, is the *cristallina*, made in the valley of Medels Grisons.

The *Vacherin* is the only soft cheese of large size made in Switzerland. There are two sorts, the first made about Gruyère, and in appearance like the cheese of that name; the other is made in the valleys of the Jura. The latter is 25 to 30 centimeters in diameter, 4 to 6 centimeters thick, and weighs 3 to 5 kilos. It is sold in drums, and if perfectly mature has an exquisite flavor. The *Mont d'Or* of France is the same as the Vacherin of the Jura.

Some of the Swiss papers have rather ridiculed a suggestion in one of my previous reports that a market might be found here for American beer, cheese, and butter. In the matter of cheese, the competition of the imported article would be with none of the foregoing kinds, some of which have little or no sale in the country, and some are in demand for the special qualities, but with the ordinary kinds made everywhere in great abundance for home use and largely taking the place of butter, and even meat. I believe that a good American article that could be put on the market here at 150 francs the kilo would find a sale.

A.—*Quality of different Swiss cheeses.*

Description.	Consistency.	Fatty matter.	Coagulation.
Emmenthal	Firm	Gras	By rennet.
Gruyèré	do.	Mi-gras	Do.
Spalen, old	Hard	do.	Do.
Spalen, new	Firm	do.	Do.
Urseren	do.	Gras	Do.
Formaggio della paglia	Soft	do.	Do.
Battelmatt	Firm	do.	Do.
Appenzell	do.	Maigre	Do.
Gessenay	Hard	Gras	Do.
Cristallina	Firm	do.	Do.
Vacherin	Soft	do.	Do.
Bellelay	Firm	do.	Do.
Valais	Hard	do.	Do.
Praettigau	Firm	Maigre	Do.
Vaud	do.	do.	Do.
Tomme	Soft	Gras	Do.
Schuabziger			By sour milk.
Blocler	Firm	Maigre	Do.

A *fromage gras* or cream cheese is of unskimmed milk; *maigre* of skimmed milk; migras, of partly-skimmed milk.

B.—*Analysis of Swiss Cheese.*

Component parts.	Emmenthal.	Gruyère.	Bellelay.	Gessenay.	Vacherin.
Water	34.92	34.57	37.52	12.40	27.21
Fatty matter	31.26	29.12	30.05	34.35	45.87
Caséine	29.88	32.51	28.88	46.80	25.28
Salts	3.94	3.80	3.48	6.45	1.64
	100.00	100.00	100.00	100.00	100.00
Fatty matter	41.1	47.3	51.	42.4	51.8
Caséine	48.90	52.7	49.	57.6	48.2
Total	100.00	100.00	100.00	100.00	100.00

C.—*Exportation, in metric quintals, of Swiss cheese,* 1810 *to* 1880.

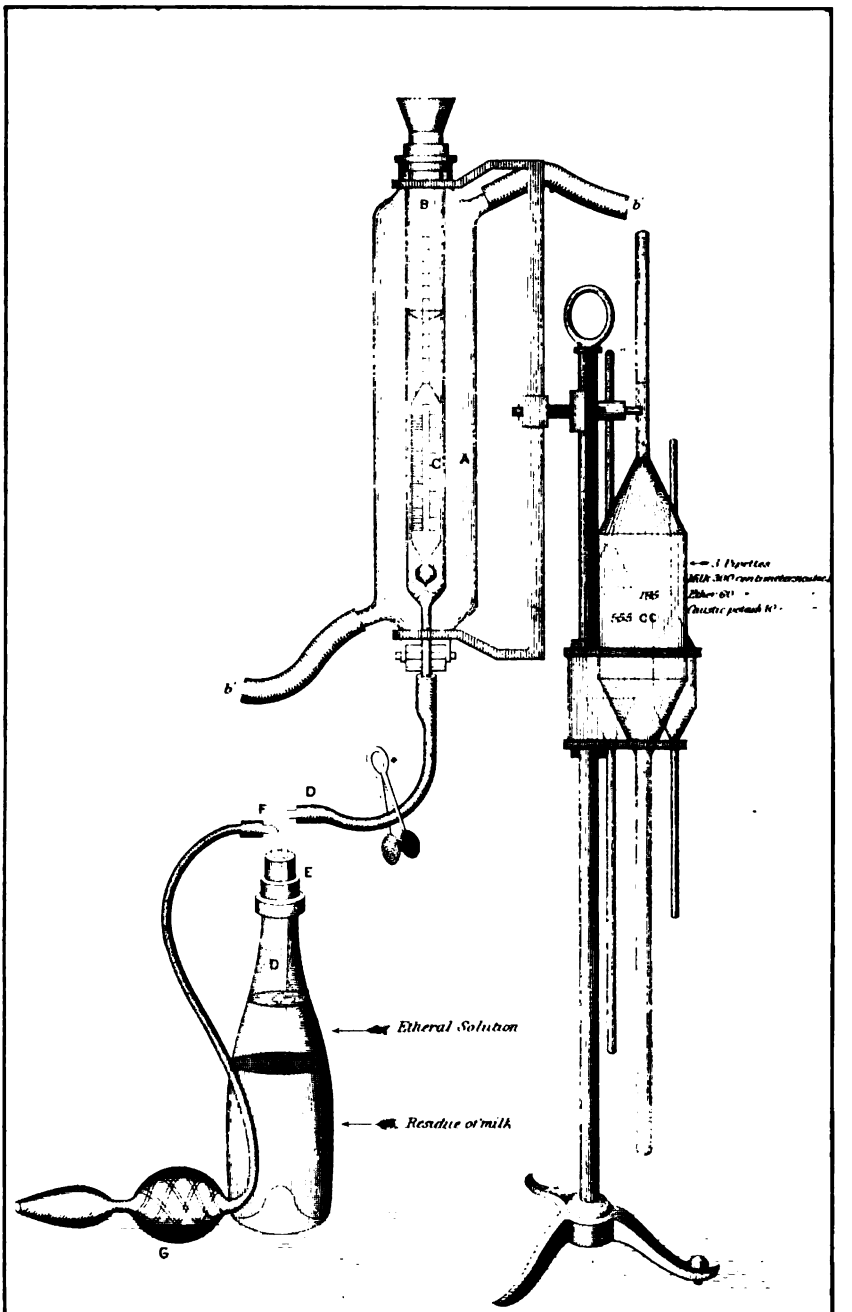
[The metric quintal = 100 kilos.]

Year.	Metric quintals.	Year.	Metric quintals.	Year.	Metric quintals.
1810	6,000	1866	125,522	1874	204,326
1825	10,000	1867	148,386	1875	198,671
1860	73,395	1868	141,869	1876	200,907
1861	83,428	1869	162,446	1877	177,990
1862	86,020	1870	169,860	1878	195,799
1863	83,608	1871	206,707	1879	210,174
1864	92,717	1872	192,715	1880	217,189
1865	126,807	1873	196,026		

D.—*Importation and exportation of cheese,* 1877 *to* 1880, *in metric quintals.*

Year.	Importation.		Exportation.	
	Quantity.	Value.	Quantity.	Value.
	*q. m.**	*Fr.*	*q. m.*	*Fr.*
1877	13,684	2,189,600	177,990	32,038,200
1878	13,371	1,871,940	195,799	31,327,840
1879	12,112	1,574,560	210,174	31,526,100
1880	13,254	1,723,020	217,189	34,750,240

*Metric quintal = 100 kilos.

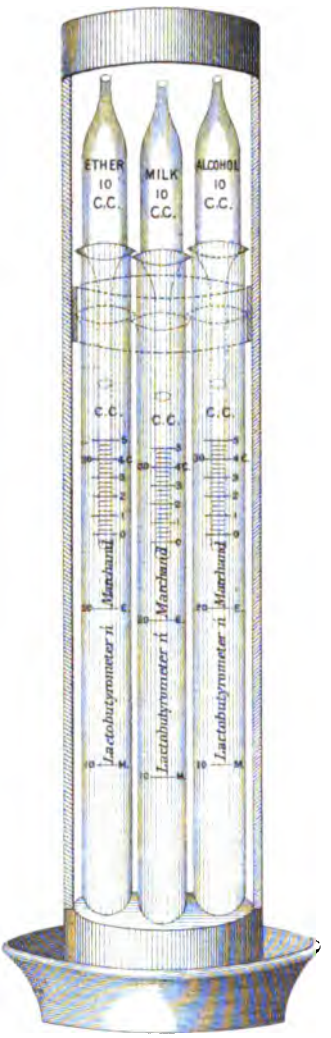


A. Glass tube filled with water by inserting b' in the water and suction at b and then, closing the 2 ends.

B Inner tube in which the aerometer floats in the Etheral Solution pumped up from the bottle through D, and there retained by putting on the stopper.

Julius Bien & Co. Lith.

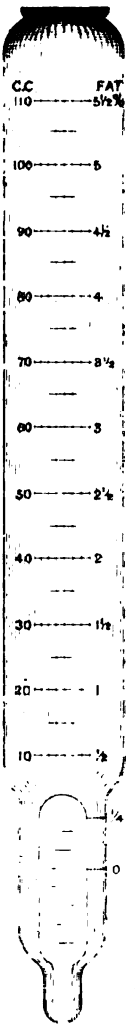
PROFESSOR SOXHLET'S AEROMETER FOR EXTRACTING FAT.



Julius Bien & Co. Lith.

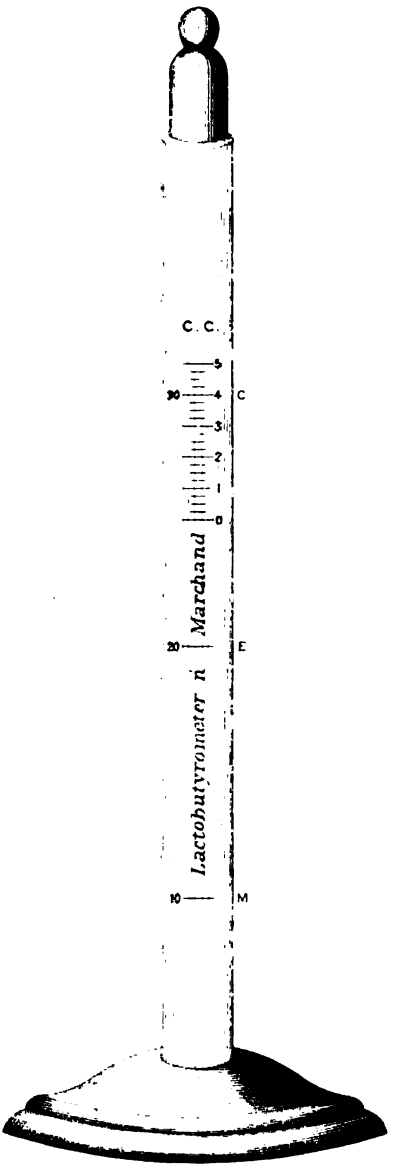
COPPER BATH SHOWING 3 PIPETTES

AND THREE LACTOBUTYROMETER TUBES WITHIN

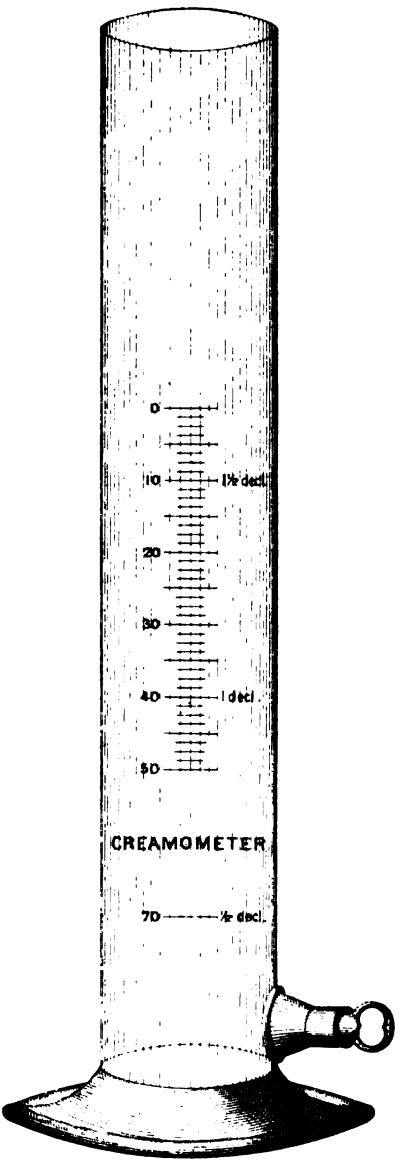


Julius Bien & Co. Lith.

FESER'S LACTOSCOPE



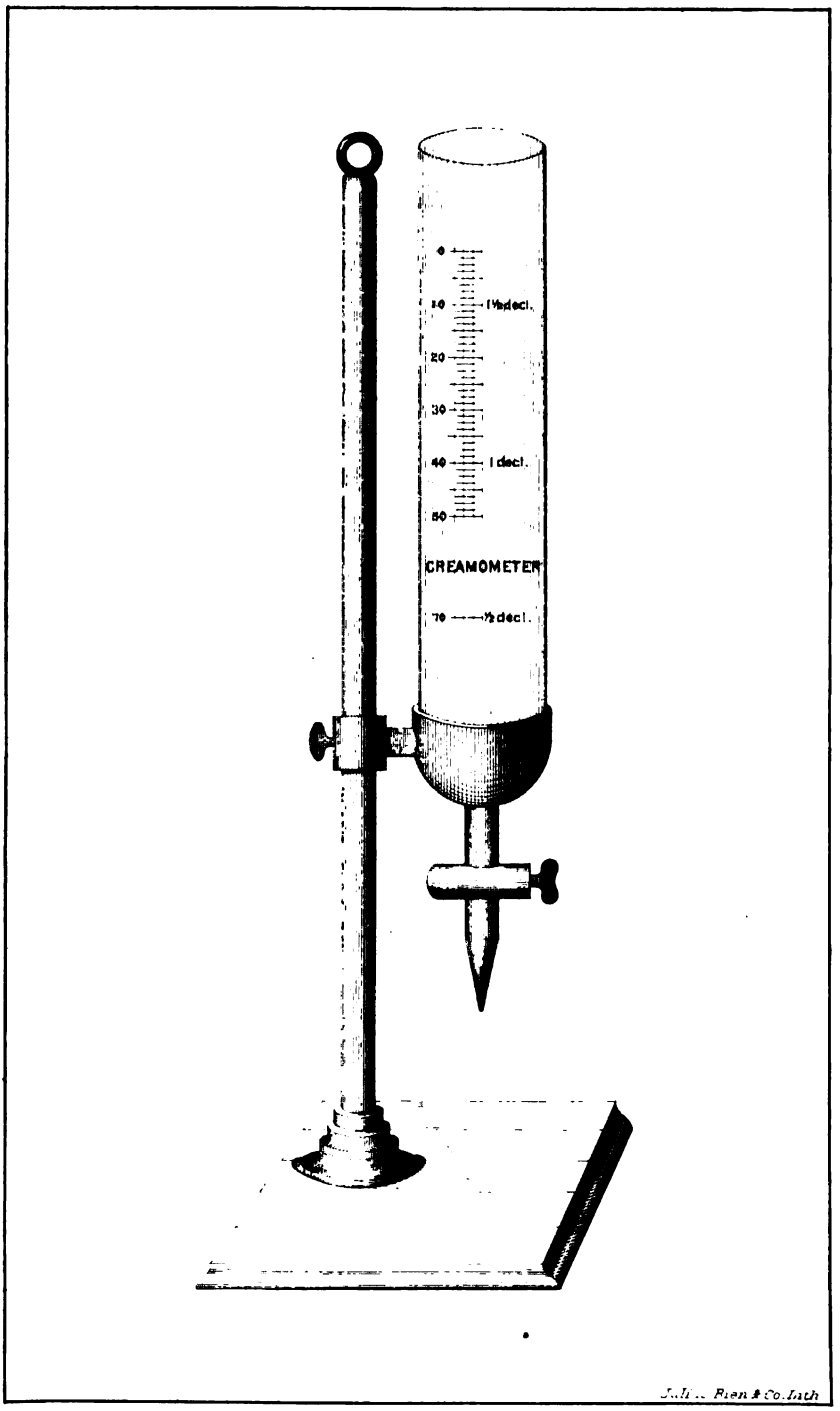
LACTOBUTYROMETER ON STAND. WITH STOPPER



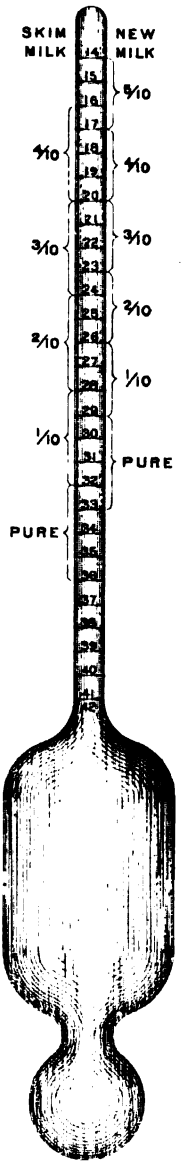
Julius Bien & Co. Lith.

GERMAN CREAMOMETER OR CREAM TESTING TUBE

WITH BOTTOM OUTLET



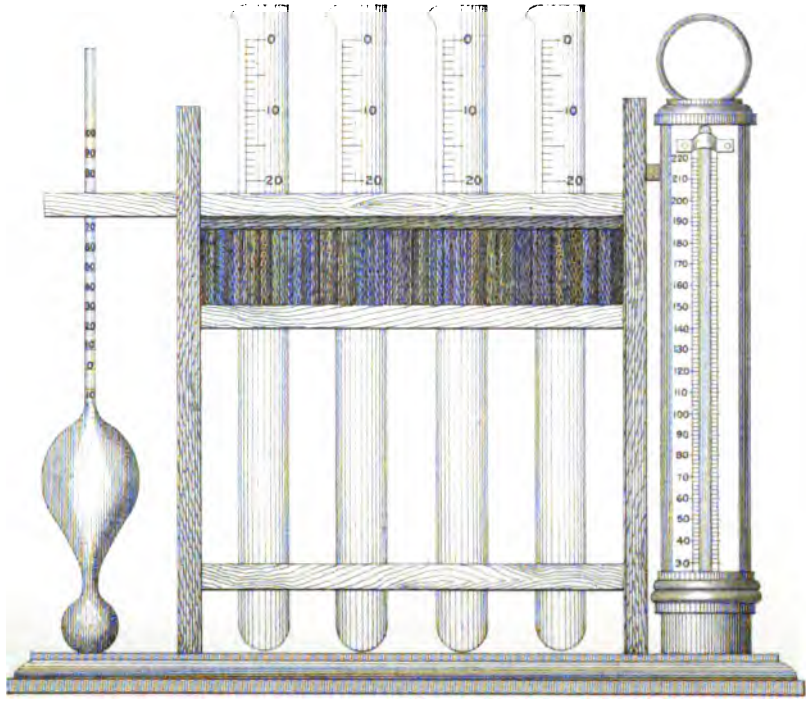
CREAMOMETER ON STAND



Julius Bien & Co. Lith

QUEVENNE'S ORIGINAL LACTOMETER
OR LACTODENSIMETER.

1. 2. 3.



The black space is of slate for writing down the cream yield

Julius Bien & Co. Lith.

MILK TESTING SET

1. LACTOMETER 2. CREAM GAUGE 3. BUTYROMETER

E.—*Prices per 50 kilos of different varieties of Swiss cheese from 1851 to 1880.*

Year.	Emmenthal	Gruyère de Montagne.	Gruyère de la plaine.	Spalen.	Year.	Emmenthal	Gruyère de Montagne.	Gruyère de la plaine.	Spalen.
	Francs.	*Francs.*	*Francs.*	*Francs.*		*Francs.*	*Francs.*	*Francs.*	*Francs.*
1851	52	42	40	35	1866	56	49	45	50
1852	48	40	38	35	1867	66	48	53	48
1853	52	46	45	37	1868	71	59	57	61
1854	56	47	45	39	1869	75	60	57	69
1855	58	51	49	40	1870	66	62	59	71
1856	57	50	48	41	1871	77	67	66	57
1857	61	53	51	49	1872	85	71	70	67
1858	62	54	53	51	1873	93	74	73	77
1859	66	54	55	49	1874	75	60	55	78
1860	70	54	52	50	1875	90	62	60	59
1861	57	54	52	49	1876	90	79	78	69
1862	56	51	47	53	1877	90	76	77	82
1863	67	53	50	54	1878	76	62	60	60
1864	68	59	59	57	1879	75	63	63	60
1865	65	55	54	56	1880	85	79	78	73

F.—*Highest quotations of cheese in different Swiss markets per kilo for October*, 1880.

Markets.	Fromage gras.	Fromages maigre.	Markets.	Fromage gras.	Fromages maigre.
	Francs.	*Francs.*		*Francs.*	*Francs.*
Morges	2.00	1.20	Neufchatel	2.00	1.40
Nyon	2.00	1.30	Sion	1.30	0.90
Vevey	2.40	1.60	Geneva	2.20	1.25
Yverdon	2.00	1.10	Fribourg	1.60	0.40
Moudon	2.00	1.40	Bulle	1.75	1.10
Payerne	2.00	1.50	Delemont	2.00	1.50

LYELL T. ADAMS,
Consul.

UNITED STATES CONSULATE,
Geneva, November 25, 1881.

SCIENTIFIC DAIRY INSTRUMENTS.

REPORT PREPARED FOR CONSUL SHAW, OF MANCHESTER, BY MR. JAMES LONG, OF HETCHIN, ENGLAND.

Milk testers are not particularly numerous; indeed, it is questionable whether an absolutely perfect instrument can be devised inasmuch as specific gravity, as well as the cream test has proved inefficient when used alone. The use of the lactometer, creamometer, and thermometer in combination, however, are found to be very sure tests; and although, in cases of prosecution, analysis is resorted to yet in private practice, the above will answer every purpose. Cream is measured in a glass tube called a cream-gauge or test-tube or in a glass jar and called a cream measurer or creamometer. The lactometer is really a hydrometer adapted by a modification in its scale to test the density of milk instead of the density of water—in like manner as by other modifications suited to the requirements of the various liquids, separate forms of the hydrometer are made and known by the names of alcohometer, saccharometer, &c. In the accompanying illustration the lactometer is on the left hand, and a set of test-tubes or creamometers are between the lactometer and thermometer.

The lactometer (called the "lactidensiméter" or "éprouvette" on the Continent) is used for gauging the density of milk. It was invented by M. Quevenne, a medical man in Paris, and is now in general use, although the scale differs in various countries. It is similar to an ordinary hydrometer, and is furnished with a scale, which shows the density of the milk at a glance. A given volume of water weighing 1,000 pounds, is no larger in

bulk than a similar volume of milk weighing 1,029 pounds to 1,033 pounds, according to its quality; and, bearing this in mind, Quevenne taking off the ten, used the other two figures upon his lactometer. His scale commences at 14, which is at the top, and descends to 42 at the bottom. It is apparent that 14 (otherwise 1014) is far too low to be pure, but the margin is a wide one, while 42 (1042) is just as much the other way.

When the instrument is placed in the milk (which should be done very gently, in order that it may not sink, and cause milk to adhere to a point above that at which it floats, or it will not be true), the figure which is level with the surface will show the true state of the case. Thus, in Quevenne's, if it rests between 29 and 33 it is pure; if between 27 and 29, $\frac{1}{10}$ water has been added; between 24 and 26, $\frac{2}{10}$; if between 21 and 23, $\frac{3}{10}$; and so on. A sketch of this instrument is shown.

With English lactometers the scale commences at the bottom at 10, goes up to 0, and then up to 100, at the top. Pure milk marks 0, pure water 100; thus every figure between shows the actual adulteration, the ten spaces below 0 indicating when milk has been skimmed. These lactometers are usually employed in milk heated to 60° Fahr., while the Quevenne is used at 59° Fahr. (15° centigrade and 12° Reamur).

An advantage of Quevenne's scale is that it tests skimmed milk as well as whole milk, the same figures being made to apply by being bracketed; thus 33 to 36 indicate purity, and skim milk being heavier than new milk, the lightest portion, cream, being skimmed from it, while the addition of water is shown between 32 and 17. There is no doubt that Quevenne's instrument acts well when used for mixed milk; but it often varies considerably with the pure milk of individual cows.

In using the lactometer it is best to have a deep and narrow glass vessel, similar to a creamometer, in which the milk is poured at the right temperature. When the instrument is placed in the milk, it must be held by the stem until it floats at the right mark; that it be not made too heavy, as mentioned above. If it sinks below the pure-milk mark the percentage of watering may be suspected. Thus, supposing the lactometer to be an English one, measuring 0 to 100, if one-half the liquid be water and the other half milk, it will sink to 50; if 20 per cent. of water is added, it will sink to 20, and so on.

It must be remembered that the lactometer can not be expected to do more than it professes; it denotes the gravity of milk, and if that gravity is anywhere near the average, all well and good; but, as the milk of different cows varies in gravity, so does the instrument cease to be a specific guide when applied to these distinct samples. If in testing a sample it is found lighter than the average, there is reasonable suspicion that it has been watered; if, on the contrary, it is found heavier, there is ground for believing that it has been skimmed.

The English lactometer shows this on the scale 10 to 0. It has been shown that inasmuch as cream, like water, is lighter than milk, a sample heavy in cream would appear to be adulterated just as though it had been watered; while, on the other hand, if salt or sugar were dissolved in the milk, they, being heavier, would cause it to show that, to all appearance, the milk had been skimmed. Thus it is always well to use the creamometer and lactometer in conjunction with each other, so that when both point to watering or skimming there is little doubt of the fact. Again, it is well to use the creamometer even when the lactometer is satisfactory, for it can be cheated. As has been shown, if water is added to milk it is made lighter, and that if skimmed it becomes heavier from the loss of its lightest constituent; it is therefore possible to first skim it and then bring it back to its normal gravity by the addition of water. Although the lactometer would not detect this, the creamometer would.

It was found by Chevalier, by experiment, that the value of the glass creamometer is much regulated by its diameter, in accordance with its height. In using it the milk is poured in until it reaches the top line, 0°, and left for twenty-four hours in a room at about 60°, by which time it will have formed a cream of 7° to 25°, according to its richness. This instrument is valuable, as shown above, for use in conjunction with the lactometer, and also for testing the cream yield of individual cows. By it special feeding may be tested, and thus considerable expense saved. It must not be inferred that the quality of the cream is shown by the creamometer, for cows giving the same quantity often make less butter than others. At the same time the cream test by this plan is a very valuable one.

The thermometer is a most necessary instrument in the dairy, as without it the work is accomplished by guess; and in spite of those who prefer to trust to their innate knowledge of temperature, there is no doubt that the result affects the quality of both butter and cheese very materially.

A lactoscope was recently invented by Professor Feser, of Munich, which is based upon the measurement of the degree of transparency of milk, which depends chiefly on the fat it contains. The instrument consists of a graduated tube, marked with a double scale, and a pipette, which is filled with the milk to be tested. This is then poured into the large tube, when water is added until the black lines are visible. The percentage of fat

will be shown. The lactoscope is a very ingenious instrument, and is in use at the Cham laboratory, Switzerland, where the chemist had made a more perfect instrument after Feser's model; but, although ingenious, it is not perfect.

A German gentleman, Dr. Heeren, has invented an instrument which he calls a "pioskop," from "pios," fat. It consists of a small round disk of india-rubber, in the midst of which there is a circular raised ring, and a glass disk of the same size, also divided by a ring in the middle, the outer part of the disk being divided into six equal parts, and colored from white into shades of blue, up to dark blue. The white signifies cream; the light blue, very fat; medium blue, normal; a deeper shade, less fat; deep blue, thin milk; and blackish blue, very thin. In working a few drops of milk are placed into the inner part of the india-rubber disk; the glass disk is next placed on the top, so that the transparent part is on the top of the milk. The milk thus squeezed changes to one of the colors named above, and thus indicates its quality. Its price is 1*s.* 6*d.*, and is sold by Beinbauer, of Hamburg.

An instrument called a "testing centrifuge" was recently invented by the Rev. H. Bond, of Worcester, Mass. It is practically as correct in gauging the cream which is contained in milk as the creamometer, but, unlike the latter, it does its work at once and more completely. It is also believed to be a better test of the availabe cream in milk than analysis, because the latter gives the total butter fats, all of which have never yet been obtained by any practical method of cream separation.

There is one more experiment which is easily performed with milk, viz, the separation of the fat, and which a little practice will enable a person to do for himself. The instruments required are a proper tube, a copper bath for the same, and a thermometer; also, some ether and alcohol, both of a given strength. The tube is divided into three parts, the top division being also graduated. First, new milk is poured in and up to the bottom line, when the ether is added to the middle line, and severely shaken until complete amalgamation has taken place. The alcohol is then added to the top line and also amalgamated by shaking, a most important point. The tube is then placed in the bath of water at 100° Fahr., and allowed to stand until the preparation of the fat is complete, when it can be measured by the gauge at the top. For ordinary purposes there is no better system for testing the butter-making properties of a cow.

For the estimation of the fat, however, which is contained in milk, Professor Soxhlet has invented an apparatus which is most valuable, and the best yet made for such a purpose. By the illustration it will be seen that the stand, which is a metal one, has a holder fitted with a movable screw for holding the glass tube A, to the projecting tubes of which the india-rubber tubes *b b'* are attached. In the center of *a* is fastened a smaller tube of glass, B, the top of which projects beyond *a*, and is closed by a cork. The diameter of B must be two millimeters greater than that of the float of the ærometer. The ærometer has a scale divided into degrees corresponding to the specific gravities, and these again are divided into halves. In the float of the ærometer is fastened a thermometer, graduated. An india-rubber tube connects the bottom of B with the glass tube at D, which passes through the cork E of the bottle, which is designated the agitating bottle, and the glass tube F, to which is attached a pair of small hand-bellows, likewise passes through the cork. The stand also holds three pipettes for the measuring of the milk, ether, and caustic potash. The caustic potash solution must be of 1.26 to 1.27 specific gravity, which may be prepared by dissolving 400 grams of fused caustic potash in half a liter of water, which, after cooling, is made up to one liter. The ether must be saturated with water, and this can be obtained by shaking commercial ether with $\frac{1}{10}$ to $\frac{1}{10}$ of its volume of water at the ordinary temperature. A large vessel of at least 7 pints capacity filled with water at a temperature of 17° to 18° C. is also required.

To perform the experiment, the milk, after having been thoroughly mixed, and at a temperature of 17°.5 C., 200 cubic centimeters are measured by the largest pipette and discharged into one of the agitating bottles, which should have a capacity of 300 cubic centimeters. Similarly 10 cubic centimeters of the potash solution are measured and discharged into the bottle containing the milk, and mixed; 60 cubic centimeters of ether saturated with water are then added. The ether when measured must be between 16°.5 and 18°.5 C. The bottle is then closed, well shaken for half a minute, placed in water at a temperature of 17°.5 C., and shaken every alternate minute for a quarter of an hour. After this it stands for a quarter of an hour (although it sometimes takes a longer period), when a layer of the ethereal solution of fat is seen on the top, which must be perfectly clear. The india rubber tube at the bottom of *a* is then placed in water at 17° to 18° C., when *a* is filled with the water by suction, and closed by connecting the ends *b b'* with a small glass tube. The stopper of the bottle is replaced by the cork E, and the tube D is so inserted as to dip nearly to the bottom of the clear ethereal solution. The cork at the top of B, and the nippers, H, being opened, a quantity of ether, sufficient to cause the ærometer to float, is forced by means of a gentle pressure of the hand bellows into the tube B, when the clamp is closed and the cork inserted into B, to

prevent evaporation. The position of the scale is then read off, that part being read off which coincides with the middle part of the deepest curved line on the surface of the liquid. The temperature during the estimation of the specific gravity of the solution must be noticed, and if it is 17°.5 C. the specific gravity will need no farther correction, for it must be understood that it is diminished by a higher and increased by a lower temperature. The temperature of the water in A may fluctuate from 16°.5 to 18°.5 C., and the specific gravity of the ethereal solution at 17°.5 C. having been found, the amount of fat in weight per cent. can be obtained from the table supplied with the instrument. The value of the Soxhlet apparatus is that the percentage of fat to the second decimal place is obtained, thus making it as valuable as actual analysis.

CREAM-SEPARATING MACHINES.

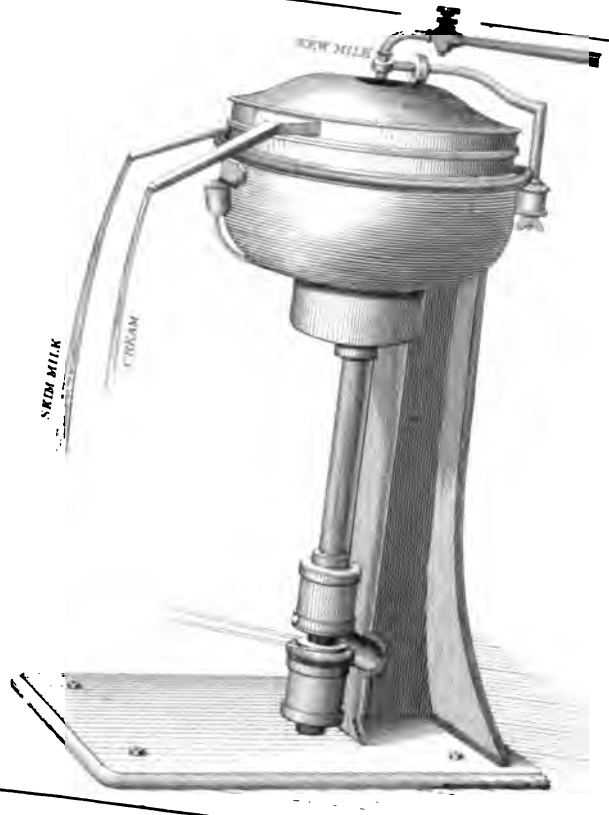
REPORT PREPARED FOR CONSUL SHAW, OF MANCHESTER, BY MR. JAMES LONG, OF HETCHIN, ENGLAND.

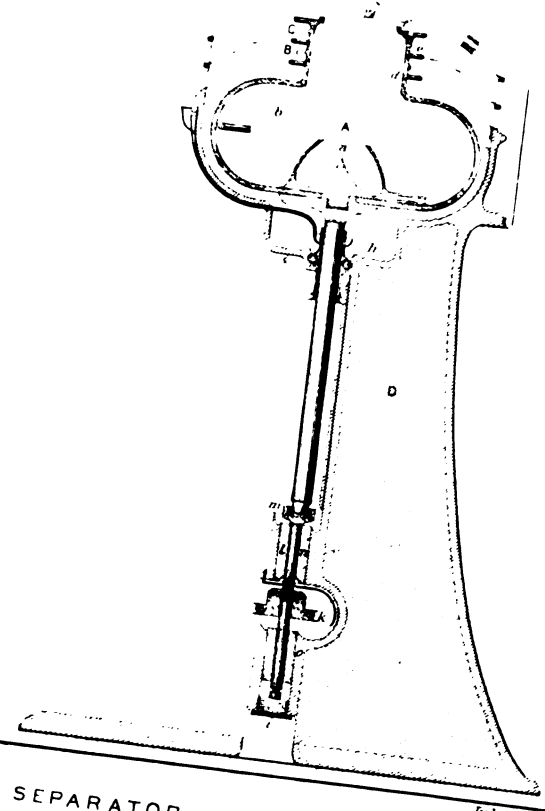
Up to the present time the most popular machine in England and France has been the De Laval, which is the only one that has been regularly exhibited. There are two reasons for its popularity—its price, which has varied between £30 and £37, and its value—for it is a good machine. Perhaps it also ought to be said that it has no opposition in either country, for this is almost the fact. True, three other machines have been exhibited in England; but in one case, the "Danish," patent difficulties have prevented its sale; in another, the "Lefeldt," is very much more expensive; and in the third, the "Petersen," a quite new machine, which competed at the Royal last year against the Laval for a gold medal. It was far higher in price, suitable only for big dairies and factories, and did not take off all the cream. There is, however, a difficulty with the Laval, which its inventor can not overcome; it requires a great deal of power for so small a machine, and it cannot be made in smaller or larger sizes, these being most insuperable objections when rival machines are introduced without them.

The De Laval is the invention of a Swede of that name, but it is not the earliest invention, for centrifugal force, which is in reality forced gravitation, as applied by an English inventor, was first used by a German, Professor Fuch, as early as 1859. In Laval's machine the receiver revolves with the milk some 5,000 times a minute and takes the cream from some 200 quarts an hour. This receiver, which is made of steel, works upon a vertical axis, and is filled with the milk through the medium of a funnel which passes into it from above. As the milk revolves, the centrifugal action causes the lighter cream to gather at the top in the center, while the heaver portion of the volume is forced to the outside. This being the case it only needs some additional outside power to force it outside and this is provided by the continual stream of new milk. The result is that the heavy skim milk is compelled to find its way through a tube to an outer chamber whence it runs out by a pipe. As the new milk enters and is skimmed the enlarged volume of cream likewise demands an outlet, for it cannot get to the periphery nor escape with the milk; hence it is provided with a special tube and chamber, and escapes from another portion of the machine in a similar way. As the drum is 11 meters in diameter, the surface speed of the interior required to separate the cream is about 15,000 feet per minute.

Now we will take the Danish machine, originally so called, although now that there are not one but four or five machines made in Denmark, we ought to follow the example of the Danes themselves and use the names of the makers; otherwise buyers will some day get into a difficulty. This machine, called, respectively, the Petersen and Burmeisper & Dam, is sent out by H. C. Petersen & Co., Copenhagen, which fact should be specially noted, as of the eight machines we know four are made by different firms of this name. So far, this is without doubt the best machine which has yet appeared. It is an open, flat-topped, horizontal drum, which must be fixed upon a solid foundation and can be worked by one or two horses or by steam power. The drum is about 2½ feet in diameter, or 15 inches across the open space, while the depth is 2 feet. In the center is a cone, within which is the shaft by which the machine is worked. On the top or ledge of the outside drum is an apparatus invented by Professor Fjord, of Copenhagen, and into this the milk runs as it comes from the vat; here are a set of strainers, and in each corner tubes so arranged that just as much milk can be passed through as is necessary. Each tube extends to very nearly the floor of the drum; it is bent at the end so that as the milk leaves it it runs directly onto the periphery. When the drum is in motion—and it revolves only 1,800 times a minute—the body of the milk is whirled round, and immediately becomes a wall lining the periphery of the drum. As in the

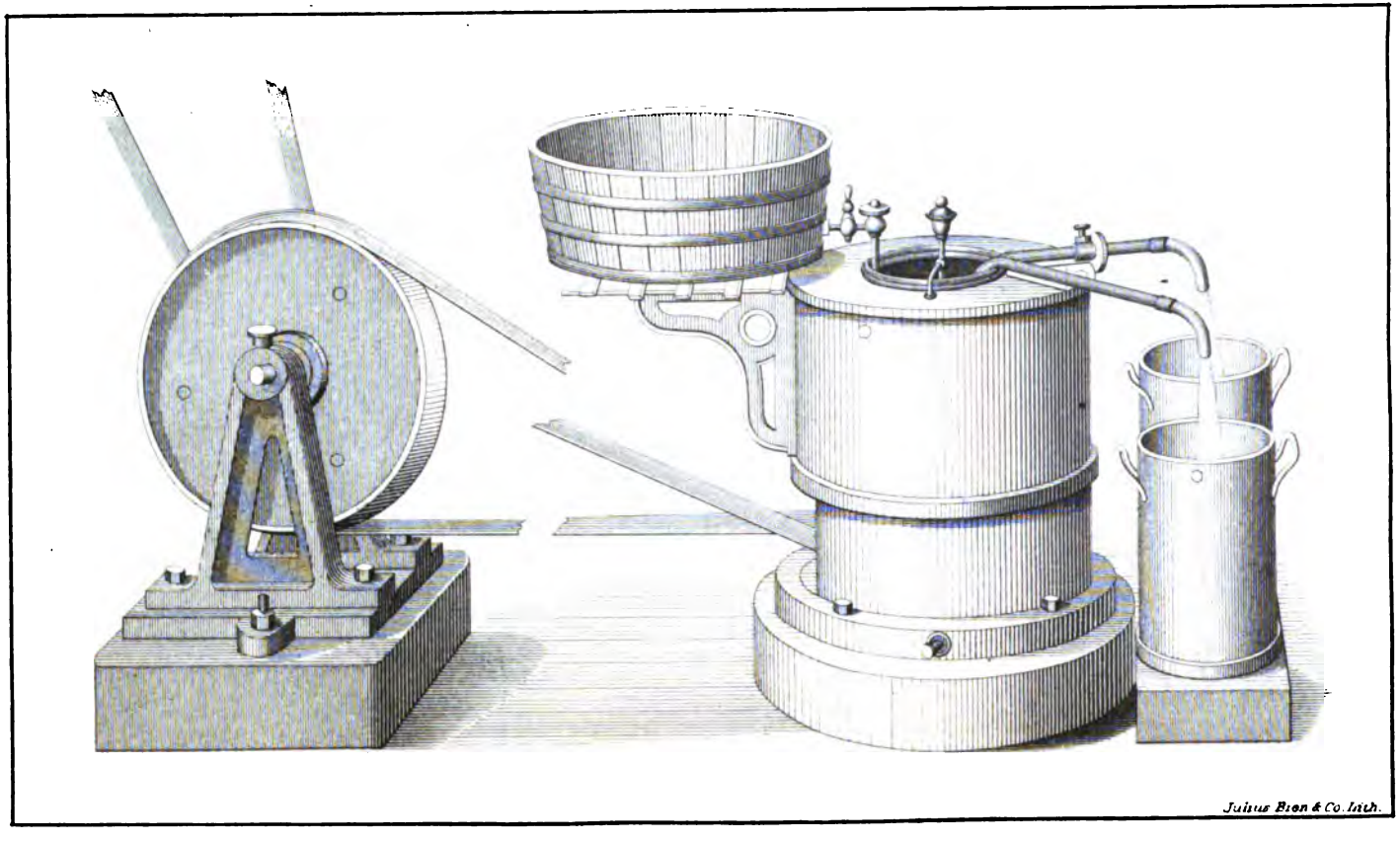
PLATE 291



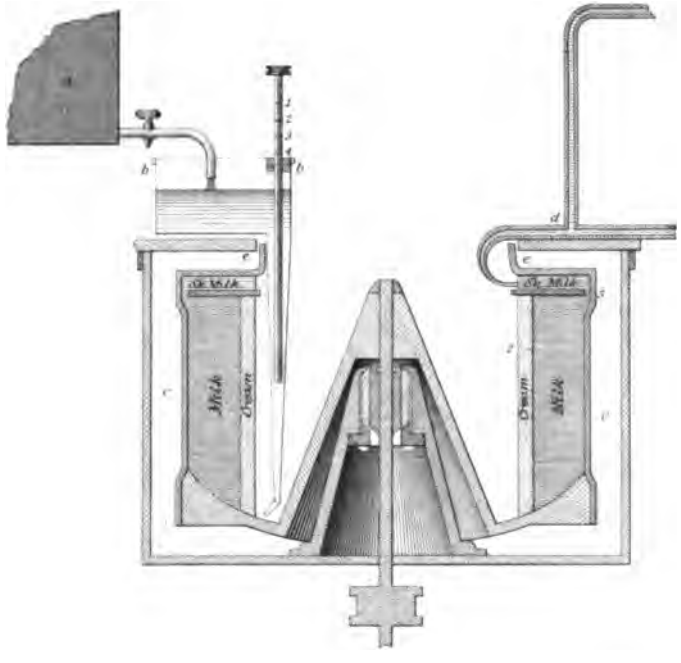


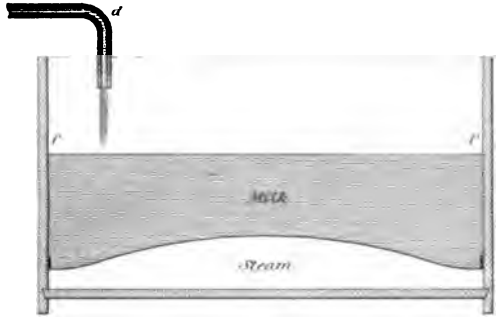
DE LAVAL'S SWEDISH SEPARATOR

Julius Bien & Co.



H. C. PETERSEN'S DANISH SEPARATOR





When the machine revolves the cream comes to the surface and the skim milk escapes through the small opening at the top of the inside of the drum (3.)

Julius Bien & Co lith

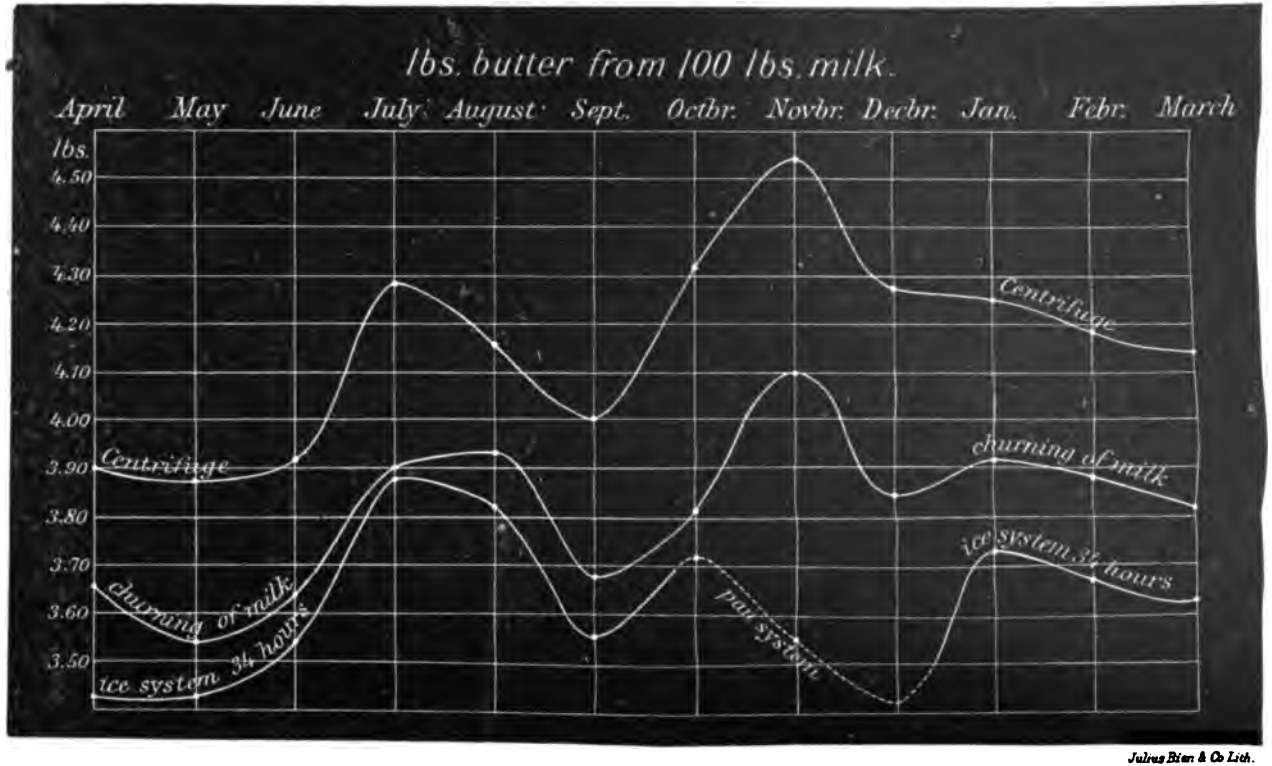
1 FJORD'S REGULATOR. 2. FLODE (CREAM.)

NOTE This is fixed upon the Danish Separator the long tubes c d reaching to the bottom of the drum. The milk falls into the inner of the 3 sieves or strainers and is passed into the machine in large or small quantities as the stoppers a b are regulated, the inflow regulating the cream taken from the milk

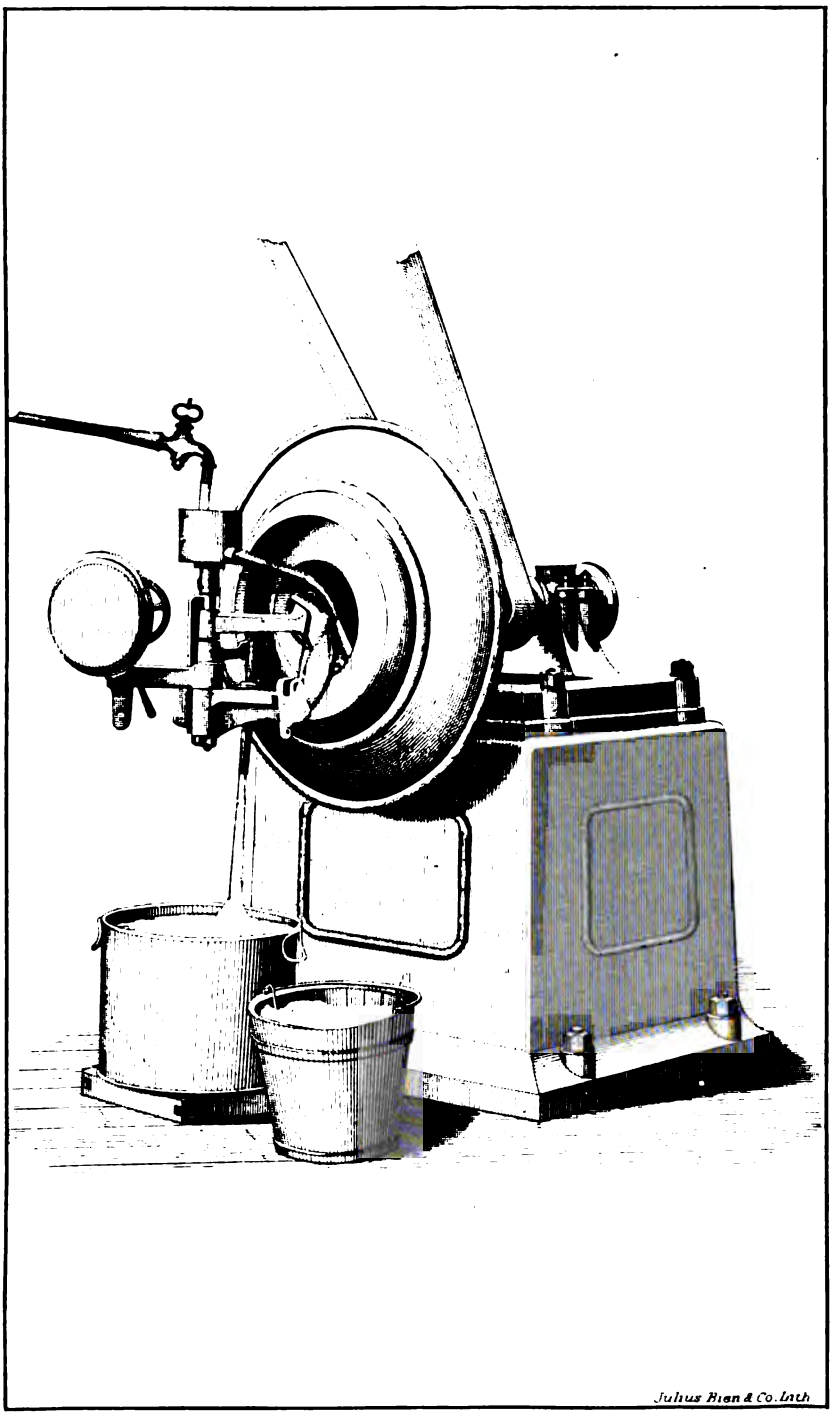
Julius Bien & Co. Lith

PROFESSOR FJORD'S REGULATOR

BY THIS MACHINE ANY PERCENTAGE OF CREAM CAN BE SKIMMED BY THE GAUGE

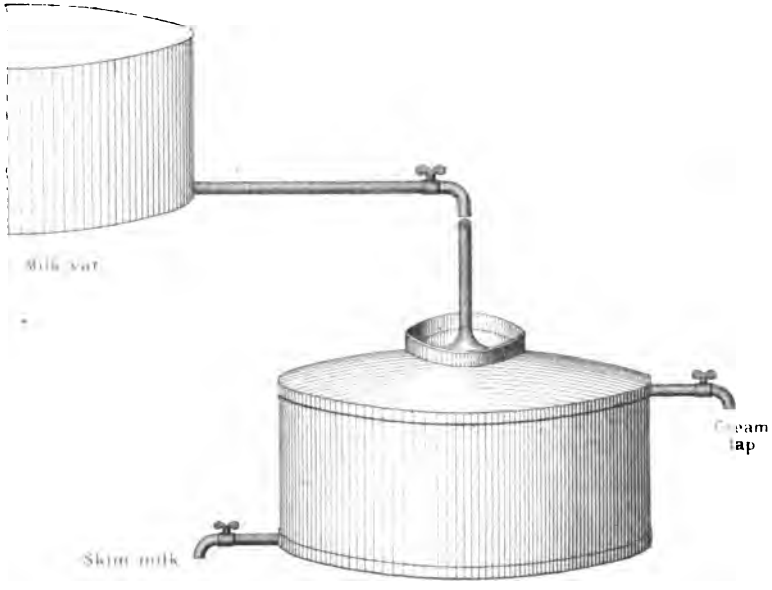


SCALE SHOWING THE VALUE OF EACH SYSTEM.

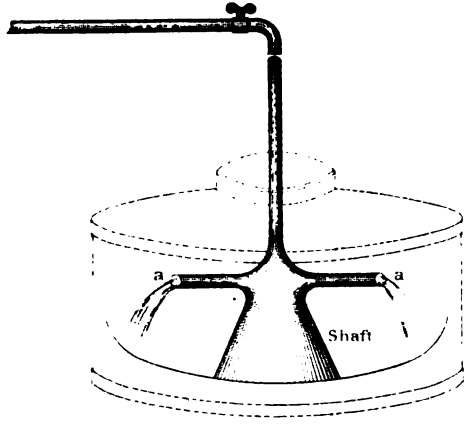


THE VERTICAL DRUM CREAM SEPARATOR

OF PETERSEN OF HAMBURG



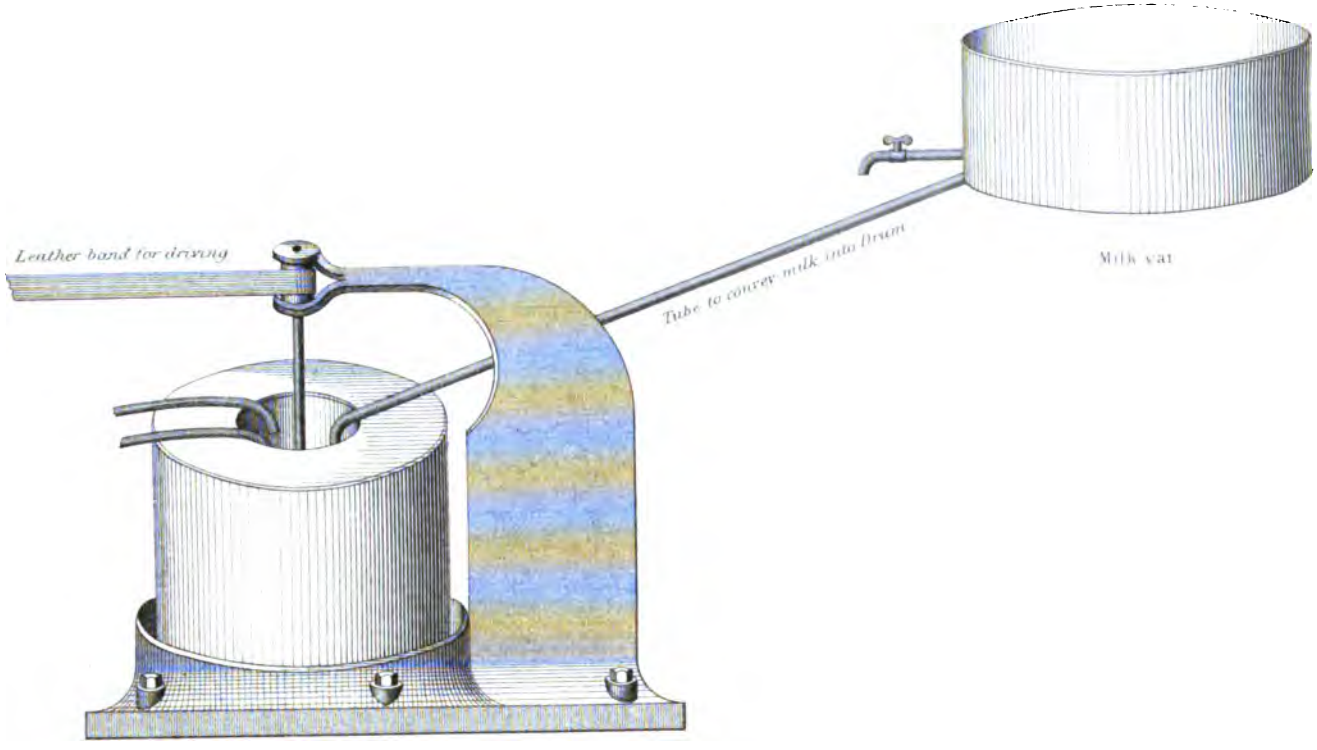
Drum



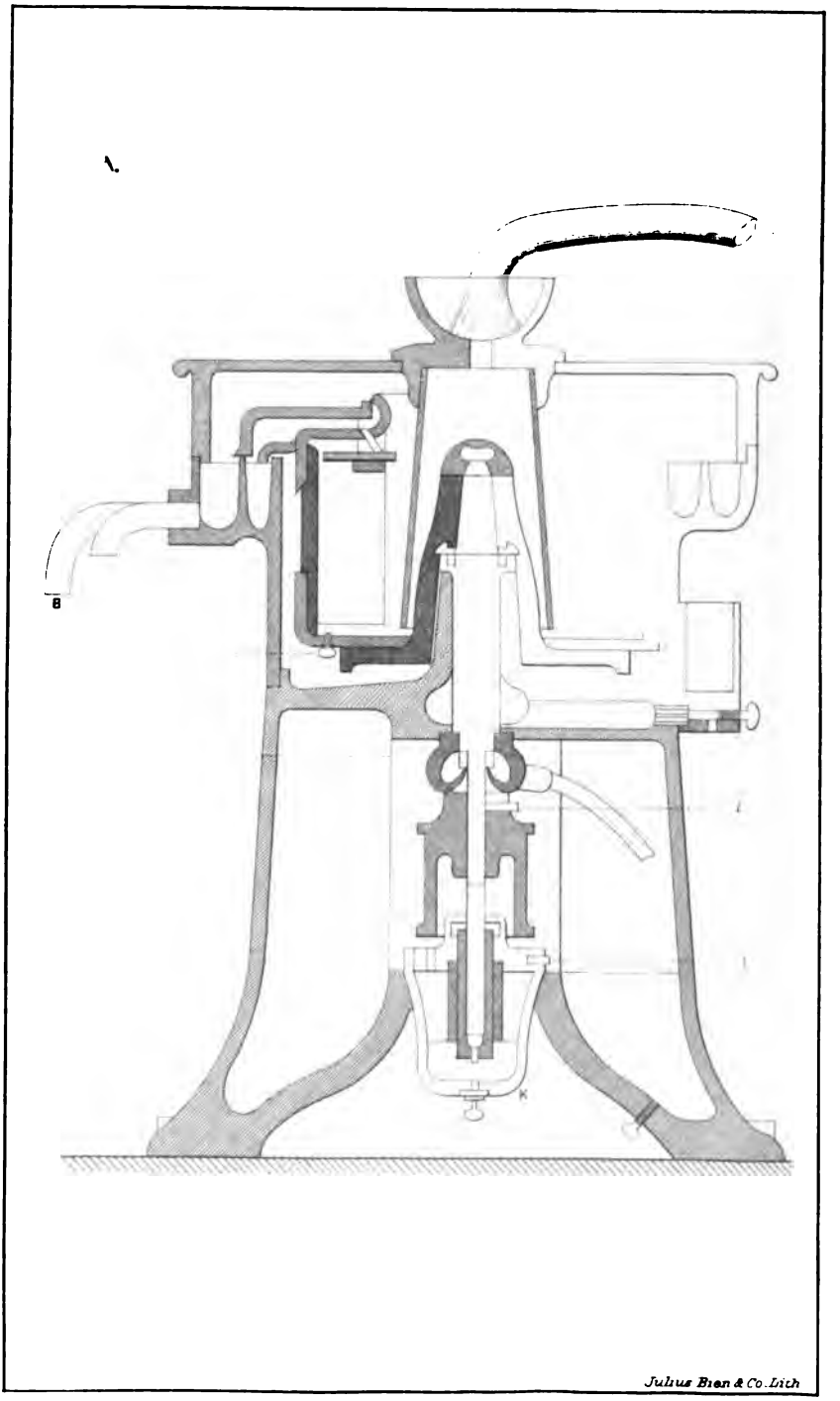
a a *These arms distribute the milk into the interior of the Drum as they revolve.*

Julius Bien & Co. Lith.

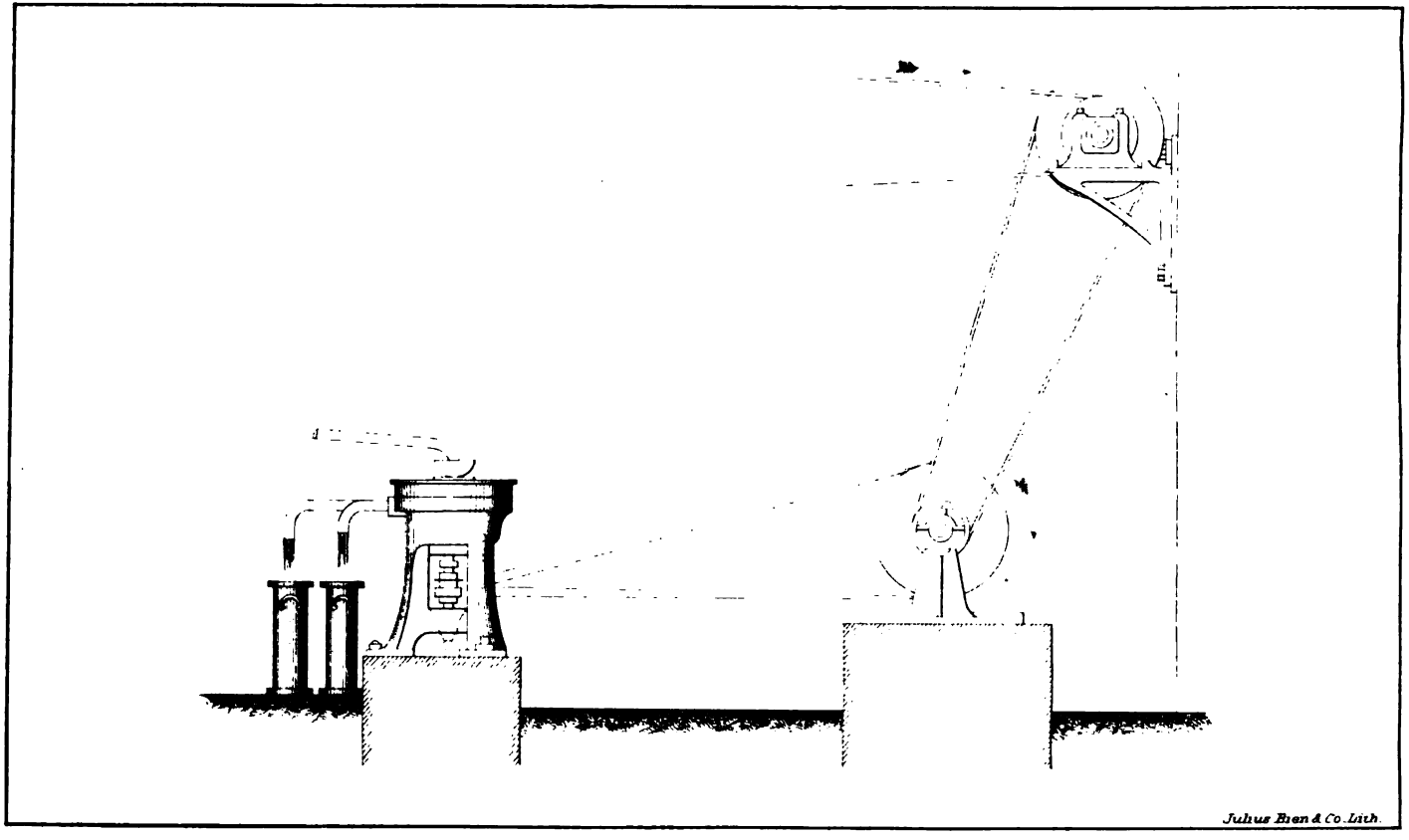
AARHUS CREAM SEPARATOR.


Leather band for driving
Tube to convey milk into drum
Milk vat
There is also an instrument affixed to the shaft to tell the speed
Julius Bien & Co. Lith.

NAKSKOV CENTRIFUGE SEPARATOR.



THE LEFELDT CREAM SEPARATOR.



THE LEFELDT CREAM SEPARATOR.

De Laval, centrifugal force brings the cream to the surface and to the top, where it is met by a sharp tube, fixed from the outside and literally cut off, the tube acting like a plane and making a furrow into which the band of cream rushes only to be cut off the faster. It rushes down this tube and out into the pail set to catch it. As the milk continues to be poured in and the cream to be cut off, the skim milk at the back is forced through an outlet at the top into a little chamber above the cream, where it is taken by a cutting tube in a similar manner.

With regard to Professor Fjord's apparatus, it may be mentioned that if all the cream were required, a plain tube only would be necessary; but as different milk producers and dealers have their own ideas, they must be consulted. One may wish to make cheese, and leave a portion of the fat in the milk; another may prefer to sell skim milk which is still rich in cream, for there is no denying the fact that this separator takes more cream from it than can be obtained by any old system. For this end, then, Fjord's regulator is used, and by its aid any proportion of fat can be taken. Thus if the supply be increased by regulating the tubes, the skimmer will only take the same quantity of cream, consequently more must be left in the milk.

The last addition to this machine is an ingenious machine by which the revolutions are counted, and this does Mr. Peterson, who is really the inventor of the machine, great credit. This gentleman claims to skim with his large machine 1,200 pounds or 120 gallons an hour. This statement is not an exaggeration, for, when in Sweden, the manager of a large factory, where the centrifuge is worked, in answer to a question told us that he separated 200 Swedish cans an hour, this can being 6 pounds. The cream, too, can be taken of any thickness, so that indeed a spoon will stand upright in it.

The large machine costs 1,100 kroner Danish, or about £60, while the smaller is 650 kroner, this revolving nearly 2,800 a minute, skimming nearly 600 pounds of milk, and working by one horse. There is also a tube which will carry the skim milk away overhead into a vat, instead of into a pail below. It should be mentioned that in all cases the temperature of the cream and the quality of the milk has much to do with the results, and to this end it is now the custom to heat al lmilk to its temperature on leaving the cow by passing it over hot water or steam tubes as it runs into the machine.

In comparing this machine with the Laval, we find, first, that it requires less power and does more work, its surface speed being 9,750 feet, or 5,250 less than the Laval. It can be had in almost any size, and can be regulated. At the Royal trial it gave more butter, while the analysis showed—

Component parts.	Laval, 29¼ gallons per hour.	Danish, 43¼ gallons per hour.	Skim milk.	42¼ gallons.	52¼ gallons.
Water	61.46	52.32	91.72	91.82	91.36
Fat	33.44	42.68	.29	.11	.44
Casein and sugar	4.56	4.42	7.22	7.32	7.41
Mineral	.54	.58	.77	.75	.79
Total	100.00	100.00	100.00	100.00	100.00

During the past year the most important contest which has yet taken place was held at the Danish Exhibition in Aulborg where prizes were offered for large and small separators. The Danish of Petersen easily won in the large class, two of his machines competing, one running at 1,900 and the other at 2,100 revolutions per minute, the indicated horse-power being 1.3. In the small class the jury selected the Danish and the Laval for trial at a farm-house under the superintendence of Professor Fjord. Everything was done which science could devise to make the experiment complete. Every minute during the trials the speeds of the axle, of the horse gear, of the vertical axles, of the separators, of the rotary dynamometer, and of the intermediate motion, were written down by self-registering indicators. The Danish gave a speed of 2,400 to 3,000 per minute, and the Laval 5,600 to 7,000, the result of the five series of experiments which were made being that where both separators were driven by the same power the Danish skimmed 565 pounds (Danish pound is equal to 1.12 pounds English) per hour, leaving 20 per cent. of fat in the skim milk, and the Laval 450 pounds per hour, leaving 24 per cent. in the skim milk; or, in other words, it was shown that at the same degree of skimming and with the same supply of milk the Laval required one-third more power than the Danish, or, supposing that the same power is consumed, the Danish small

machine skimmed one-third more than the Laval. When the supply of milk was the same and the consumption of power also the same, the Laval left 64 to 65 per cent. more fat in the skimmed milk. Under these circumstances the Danish machine took the other gold medal.

Now we may refer to the Lefeldt, which is the oldest machine now in use, and which, like the above machines, has been recently improved. In appearance this machine is not unlike the Laval, but is more expensive. It was first produced by Willy Lefeldt, a civil engineer of Schoningen, Brunswick, who at the polytechnic school at Carlsruhe, had, it may be supposed, seen something of the invention of Professor Fuchs in that town; and in 1874 he produced the first machine which was shown at the exhibition at Bremen. The Lefeldt revolves at the rate of 2,400 upon a vertical shaft driven by bands attached to two disks, the one on a level with the machine and the other above it. The cream is taken on a principle similar to the De Laval, but the machine is much more elaborate. It is made in three principal sizes, thus: the one for separating, 400 litre (88 gallons or about 900 pounds); the price is 500 marks, or with the fixtures, £32; for 1,000 litre it is £75, and 2,000 litres £125, without fixtures. The inside diameter of the drum is 24 inches; thus the velocity required to separate the cream from the milk is 15,072 feet per minute, or a trifle more than the Laval. There is no doubt whatever of the value of this machine, for we have seen it working in Switzerland at the great Anglo-Swiss works, where it is much appreciated, as well as in Germany, and the only fault found with it is that it has now and then to be stopped.

The machine "System Henreich Petersen," of Hamburg, while working under centrifugal force, is quite unlike those above mentioned. Instead of horizontal drums and a vertical shaft it has vertical drums and a horizontal shaft, the drums being also very different in form; the diameter is large and the depth very little. Instead, too, of the circumference being flat it forms an acute angle. The shaft is fixed to an iron foundation, the drums being on each side, and when there are two used they resemble a couple of carriage wheels upon an axle. The shaft is driven from above, and the milk, which is poured into the drum from the front, is skimmed from the same position, and the bystanders can see the whole working. If, for instance, the finger is introduced and touches the surface of the milk as it revolves, it will almost be cut with the force of contact, but here a large cutting tube is introduced and takes off the cream similarly to the other systems, the skim-milk being forced into the outer chamber of the drum and also skimmed. This machine is now improved, and can be regulated to take any quantity of cream by screwing the cutter deeper into the cream, as is found necessary. The drums are made in various sizes, but are decidedly dear—the small-drum machine, holding 100 pounds milk per drum, skimming 600 pounds an hour, costs £75; if two drums are purchased then the cost is £126 5*s*. A 200-pound drum machine, to skim 800 pounds an hour, costs £95, or for two drums, skimming 1,000 pounds, £160. These machines do an immense amount of work, have great advantages on account of the power used and the possible addition of drums, but are too dear.

The "Nakskov," which has never been seen in England, is a Danish machine, made by Tuxent Hammerich, of Nakskov, and resembles the Danish or Burmeister in a great measure. We saw it at work at the exhibitions in Denmark and Germany, and we must say it did its work well, although it is a palpable copy, but without an analysis of the skimmed milk we should not like to say that it took all the cream. It has no regulator or machine to count the revolutions, and works on a shaft from above, which is fixed to a powerful bent iron arm which comes from the foundation and over the back of the drum, which is 22 inches in diameter, with a smaller opening than the Danish (9 inches). It is driven from a horizontal wheel or disk, and it is claimed to separate 350 to 400 pounds of milk per hour, the cost being £27 10*s*.

Another machine, called the "Aarhus," made by Jansen, of that town, is priced £38, and is also similar in appearance in all respects, although the working is a little different. The milk enters the machine through a tube fixed in the top of the upright shaft, and a little below this becomes two arms, each of which distributes the milk into the periphery. Here, too, is an arrangement for the escape of the milk at the bottom, the cream being taken at the top. The drum of this machine is similar to a plain round vat. At the top is a wire gauze strainer, from the tube on the top of the shaft is filled. The annexed drawing will show the system of the distribution of milk. The top outside pipe is for the escape of the cream and the bottom for the escape of the skim-milk.

Another machine is manufactured by O. C. Petersen & Co., of Copenhagen, but this did not compete in the trial, having arrived too late. The makers informed us that its price was to be 300 kroner, or about £16 10*s*, but although there appears to be some merit in it and a considerable amount of merit in the price, it is hardly perfected; yet the makers are in the hope of quickly placing it upon the market.

Again, another separator was entered by O. Petersen & Co., of Roskilde, but this not being perfected was not sent, although it also has some merit, but its price is consider-

able, 1,100 kroner. It is, however, upon a similar principle to the successful Danish, and consequently needs but a passing reference.

The last machine exhibited was called the "Solid," the invention of Hervin S. Berglund, a Swedish engineer. This is priced at 450 kroner.

I give sketches of the Danish, the Laval, the Lefeldt, the Petersen (Hamburg), the Nakskov, and the Aarhus; the last two being rough sketches made in Denmark by the writer.

A WILTSHIRE DAIRY.

STATEMENT PREPARED FOR CONSUL SHAW, OF MANCHESTER, BY MR. JAMES LONG, OF HETCHIN, ENGLAND.

The following table gives a record for seven years of the receipts in a Wiltshire dairy of English crossbreds:

Year.	Average number of cows in milk.	Number of days cows were milked during year.	Total yield of milk.	Average annual yield of milk per cow.	Milk sold.	Cheese sold.	Butter sold.		Average price of milk, per gallon.	Average price of cheese, per cwt.	Average price of milk butter, per pound.	Average price of whey butter, per pound.
							Milk butter.	Whey butter.				
			Galls.	*Galls.*	*Galls.*	*Tons. cwt.*	*Cwts.*	*Cwts.*	*d.*	*s.*	*d.*	*d.*
1881	70	308	31,634	445½	8,534	8 5½	40	5½	9	58	13	12
1880	70	308	26,386	377	7,960	7 15	34½	5½	9	52	14½	11
1879	70	308	30,513	436	3,450	12 18	36½	5½	9½	44	16½	12
1878	70	308	31,153	445	3,840	12 10½	43½	6½	9½	59	16	12
1877	72	308	28,470	395	1,790	11 11½	42½	6	10	60	17	12
1876	80	308	32,930	411½	150	13 4½	34½	5½	12	56½	16½	11
1875	70	308	24,270	346½	90	10 10	28	4	12	66	16	10

DAIRY ASSOCIATION LAWS OF WÜRTEMBERG.

[Inclosure in Consul Catlin's cattle report.]

Statutes of the Dairy Association at Heldenfingen (Registered company).

1. The undersigned associate themselves together for an indefinite period under the title of the Registered Dairy Association of Heldenfingen.

The seat is at Heldenfingen, and its object is a most advantageous disposal of milk by a joint management of the business.

2. Only persons who are of age, self-supporting, and of good character, and who own milch cows in their own right, can become members of the association.

3. Membership is acquired by signing the statutes or a written declaration of accession, after having received formal admission from the general assembly.

4. The membership is annulled (*a*) by voluntary resignation, (*b*) by death (*c*) by expulsion.

A resignation can only take place at the end of a business year; the declaration of withdrawal must, however, be sent in to the president of the association at least three months in advance, otherwise a discharge from membership can only ensue at the end of the following year.

In case of death membership ceases on the day of death; it may, however, be transferred to the widow or heirs of the deceased member, who can carry on the business, without any entrance fee, if such privilege is applied for within one week after.

Withdrawal is made by approval of the general assembly, in which case the membership ceases on the day of the approval. Expulsion *must* be acted on as soon as a member has lost the capacity to serve or his standing as a citizen; it may, however, also ensue through a non-compliance with the duties provided for by the statutes.

5. The settling of the accounts of those who may have withdrawn from membership (4 *a*, *b*, and *c*) or of their heirs takes place at the end of the business year. Their balance is, however, not paid over before six months. Also for two years from the day of cessation of membership ex-members are liable for their share of any losses by the company.

6. Members have the right—

(*a*) To take part in the general assembly and to vote there. This right ceases with the day of declaration of resignation. Female members have neither the right to vote nor admittance to the assemblies.

(*b*) To forward to the dairy all milk which they produce and to claim their payment monthly for the same from the company.

(*c*) To draw their share of profits on the basis of section 30.

(*d*) At any time to enter the dairy and take note of the conduct of its business.

7. Members are required—

(1) To pay an entrance fee of 10 marks, which sum forms at the same time their share in the capital stock without interest. On withdrawal from the company (4 *a*, *b*, and *c*) this sum is repaid.

(2) To observe the existing regulations and subsequent resolutions of the association, as well as to guard the interest of the company in all respects.

(3) To be individually responsible with their whole property in so far as the property of the association may be insufficient to meet its obligations.

(4) To forward daily a stated quantity of milk, which quantity shall be fixed by the superintendent in each case, in proportion to the number of the cattle; and particularly to acquiesce in the following rules relative to the delivery of the milk:

(*a*) The milch cows are to be well and regularly fed, as well as thoroughly milked. The udders are to be washed before milking if necessary; care must also be taken that there be sufficient straw and pure healthy air in the stable.

(*b*) The milk is to be delivered immediately after milking in a clean vessel, which must be properly cleaned after each time it is used, and must not be used for any other purpose.

(*c*) It is forbidden to deliver the milk of cows which are diseased at the udder, or not in good general health; the milk of fresh milch cows in the first five days after calving; the milk of bearing cows in the last four weeks before calving; the milk of cows newly brought in from market and which have not been previously three times milked; thin and poor milk, and in general all milk which in any of its conditions is not normal.

(*d*) At any discussions arising relative to the quality of milk, the areometer of Müller and the creamometer of Chevalier are to be applied as tests, and each member must hold himself subject to the decision resulting therefrom.

The milk is to be considered thin, when its specific weight—measured at 15° Celsius by the areometer of Müller—falls under 1,029, and it is to be considered as devoid of fat, when, after twenty-four hours of skimming, it yields less than 10 per cent. of cream, according to Chevalier's creamometer, at a temperature of 10°–15° Celsius.

(*e*) All milk which is intentionally altered by the owner to the prejudice of the association (skimmed, watered, &c.) is considered adulterated. If adulteration is proved, the furnisher has for the first offense to pay a stipulated fine of 100 marks, and in case of repetition is to be expelled from the association. Should there be any suspicion of adulteration of milk, the superintendent is to examine into the matter, and if necessary to cause a chemical investigation of the milk. He has also the right at any time to have the cows of the milk furnisher milked in order to compare the milk obtained in his presence with the milk furnished.

8. The association is to conduct its business independently with equal rights to all its members. Its directors are the executive committee and the general assembly.

9. The committee consists of the superintendent of the association, a vice-superintendent, an accountant, and two inspectors. The general assembly holds two separate elections annually, at the first of which the superintendent, and at the second the other four members are chosen. These officers are eligible for re-election.

10. The committee distribute the business among its members according to its own judgment. The vice-superintendent and the accountant are to be chosen from among its members.

11. The committee is responsible to the general assembly for its action. Its members are personally answerable for all losses resulting from negligence or malfeasance, and may for this reason be released from their duties at any time.

12. The executive committee assembles as often as the superintendent finds it necessary, or upon the request of two of its members.

13. The business of the executive committee is: (*a*) The discharge of current business; (*b*) the arrangement and care of the books; (*c*) the directing and paying of the cheese-maker and all hands required in the business; (*d*) the purchase of the necessary fuel and other articles required in the dairy; (*e*) the rendering of the yearly accounts and the taking of the inventory.

14. To form a quorum of the executive committee the presence of at least three members is required. In case of a tie the president has the casting vote. Every subject of discussion must, if two members of the committee desire, be laid before the general assembly for decision, and in this case a special meeting of the general assembly is to be called. The proceedings of the committee are to be recorded.

15. The executive committee represents the association in all legal proceedings, and signs for it. The signature is valid in the name of the superintendent or the vice-superintendent and one other member of the executive committee under the title of the association. The legitimation of the executive committee is made by a certified extract from the record of its election and that of the vice-superintendent.

16. The superintendent, in addition to the other duties imposed upon him by the orders of the executive committee and the general assembly, is required: (*a*) To issue calls for the meetings of the committee and general assembly, to preside over the same, and to take care that the resolutions there adopted are carried out to the letter; (*b*) to have an oversight of the buildings and all movable effects belonging to the association, which he, according to the inventory, has under his charge; (*c*) to order as often as possible examinations of the milk, to watch over the employés, and to hold at least once a year a special revision of the accounts; (*d*) to announce immediately to the committee any irregularity in the books or business in order that measures may be taken tending to the safety and surety of the association.

17. The accountant, who at the same time acts as bookkeeper, if the committee does not decide otherwise, has charge of all the funds of the association and keeps the books as to income and outlay according to his acquaintance with the business. Payments from the treasury of the company can only be made by written order from the superintendent or the vice-superintendent and some other member of the committee. He must allow at any time a revision of books to be made by the superintendent.

18. The call for the general assembly, which has the final decision in all the affairs of the company, and which is issued by the superintendent, must be made in writing, and not later than three days before the holding of the same, with mention of the matters to be discussed.

19. The regular general assembly, at which the yearly accounts are to be rendered, with a report of the examination of the same, as well as the election of the new committee and the auditors of accounts must take place not later than the end of February in each year. Special general assemblies can, in cases of emergency, be called in at any time; the superintendent is obliged to call them if the committee decides, or if a third of the members propose it, with a written statement of the subjects to be discussed.

20. At the elections each member has one vote, and it is not transferable. The election of officers, as well as the votes on receiving or excluding members, must be done by written ballots. On any other questions members may vote by rising from their seats, or remaining seated, provided that the general assembly may at any time decide upon another mode of voting.

21. Besides the cases mentioned in section 32 the general assembly is at any time qualified to decide whether the call has been regularly issued, with a mention of the subjects to be discussed.

22. Decisions are binding for all members of the association, if they are taken by vote of a plurality of members present. In case of a tie, the vote of the president decides.

23. The general assembly has the right to withdraw the privilege of presiding officer from the superintendent on any proposition brought before it, and to offer that privilege to any other member of the association.

24. Minutes are to be kept of all decisions, and these minutes, after having been read and adopted, are to be signed by all the members of the executive committee.

25. All subjects not expressly appertaining to the executive committee must be submitted to the decision of the general assembly.

26. The necessary funds for carrying out the objects (§ 1) of the association are to be raised (1) by admission fees, (2) by mortgage, (3) by fines and other payments.

27. The fiscal year is identical with the calendar year. At the end of the year the committee shall settle its accounts and take an inventory. The balanced account for the year is to be forwarded for examination to the auditors of accounts not later than the end of January, and is to be placed before the regular general assembly not later than the end of February with a report of the results.

28. The yearly account must include: (1) All income and outlays; (2) a special account showing profit and loss; (3) the balance showing the assets of the association at the close of the year.

In the latter are to be mentioned, under *active capital:* (1) the condition of the Treasury in ready money; (2) the securities actually in hand quoted at their market value; (3) money collectible except that not bearing interest and that of which the probable value cannot be estimated with any certainty; (4) the actual dairy products and other

stores according to the price of the day; (5) all other movable effects, with a statement of their value after deducting at least 5 per cent. for wear and tear; (6) all fixtures according to their cost (provided the general assembly does not decide otherwise); (7) all interest-bearing debts only collectible in the next year's accounts.

Passive capital.—(1) The members' shares in the business; (2) the reserve-fund; (3) debts on capital; (4) unpaid bills; (5) expenses yet due and unpaid (income, wages of hands, &c.); (6) interest yet due, but not payable before the next year's account, reckoned to the end of the year.

The surplus of the active over the passive capital constitutes the net profit, the surplus of the passive over the active the net loss.

29. Any possible loss is covered by deduction from the reserve-fund. Should the latter not prove sufficient, then the members are to bear the deficiency in proportion to the measures of milk delivered during the year passed and to pay in the amount in cash.

30. The profits are to be applied as follows: (1) A sum in marks equal to the number of hectoliters of milk delivered to the dairy during the previous year shall be applied to cancelling borrowed capital and to the formation of a reserve-fund; (2) the remainder shall be distributed among the members pro rata, according to the quantity of milk delivered; (3) when all capital debts shall have been paid and when the reserve fund shall have attained the amount of 1,500 marks the net gain shall be distributed to the members pro rata as above mentioned.

31. In order to prevent a loss in the yearly accounts, milk should not be paid for higher than at 8 pfennig per liter.

32. In voting upon amendments to the statutes or the enacting of new ones, as well as upon a dissolution of membership, the presence of at least two-thirds of all the members is necessary in the general assembly, and at least four-fifths of those present must vote affirmatively to render such action valid. If the dissolution of membership is decided upon, then the property remaining on hand after deducting the debts, will be paid over to the members in proportion to the quantities of milk delivered by each member to the dairy during the last two years. The same rule is applicable to the payment of debts. The liquidators are to be chosen by the General Assembly.

33. All disputes concerning decisions under these as well as future statutes of the association shall be acted upon by the general assembly. No member is allowed to waive this, and the law has no voice therein.

34. All publications of the Association shall be made in its firm name and over the signature of the superintendent, in the newspaper published at Heidenheim, entitled the "Grenzboten," also in the Württemberg Weekly Journal for Agriculture.

35. In questions not provided for by these statutes, the German Association law shall decide.

TRANSPORT OF CATTLE.

REPORT PREPARED FOR CONSUL SHAW, OF MANCHESTER, BY MR. JAMES LONG, OF HETCHIN, ENGLAND.

Inquiries under this head have been made of every firm of shippers to America in England, but the great majority have nothing to do with the transport of live-stock. Particulars, however, have been obtained from some firms which will be found of considerable value, but it appears that the general arrangements of fitting stalls, feeding, cartage, and minor matters are usually left to and made by independent persons of whom, so far as can be learned, only one, Mr. Sherlock, of 0 Canning Place, Liverpool, is regularly engaged in the business and able to give specific information. There are other persons who undertake this work but only in a casual way, as they may be employed by breeders, or dealers in cattle in their particular districts. Some persons make their own arrangements and send stock men across the Atlantic whom they have themselves selected for the work. Mr. Sherlock's particulars, however, will be found most valuable, and the account he annexes will be a good guide to intending shippers. There is not always the necessity for engaging any particular firm unless the number of animals to be sent is large; for if the British exporter is an intelligent and careful man he can surely be trusted to manage this without the additional expense of an agency.

The writer has himself exported to America and found little or no difficulty in the matter. Communication was made with the shipping firm who forwarded information as to the time when the cattle were to arrive and where they were to be sent. They were fitted with specially-made halters, insured, and victualed with an ample quantity of food. They were then met at the station, conducted to the vessel, and placed under the care of one of the men on board who was allowed for the purpose and used to the work. In such a case the vessel is watched from the other side, and the animals taken

charge of by the purchasers immediately upon arrival, quarantine of course not being forgotten.

The Cunard Company (Limited), of Liverpool, furnish the following particulars: Shippers of British cattle to America should be careful to select the largest type of vessel, with high 'tween decks and good speed. The animals should be berthed on the main deck, under a spar-deck (never exposed to the weather), where there is a certainty of ventilation. The owner's own servants take the care and management on the voyage and providing the food. The ship finds fittings and water. The cost of the freight will depend upon the season of the year, as, according to the British passenger acts, the number of steerage passengers in the vessel is limited by the number of cattle carried. Up to March and after July freight can be obtained at a cost of from £8 8s. to £12 12s. per head, according to the number. Shipment is generally effected by the animals walking on board (which is a great advantage over being slung), and the discharge in the same way. The trade is greatly hampered by the enforcement of quarantine by the American Government on healthy and unhealthy animals alike.

Messrs. George Warren & Co., of Alexandra Buildings, James street, Liverpool, state: The freight on horned cattle from Liverpool to Boston ranges from £3 to £5 per head, according to the number shipped. For single beast of high value £10 10s. has been paid, the shipper taking all risks of the voyage. The fittings, food, and attendance are found by the shipper, and therefore we cannot give you any information on this point, but we would refer you to M. Sherlock, esq., Canning Place, Liverpool, who has frequently shipped sheep, cattle, and horses.

Mr. Sherlock has furnished the following information: I have thought it best to give a memorandum showing the expenses incurred on shipment of two horses in May, 1885. I have discarded odd money, but have given sufficient in order to enable one to gather some information. I have been shipping cattle, horses, cows, and sheep for over twenty years. I shipped three or four herds of Guernseys, some valuable horses, and two lots of sheep lately; and with my experience, therefore, I am in a position to give considerable information. My greatest feat was the purchase and shipment of sheep in 1882, assisted by a retired farmer. We selected thirty-seven rams of six different breeds, and shipped them. This year, 1884, we purchased ninety-nine ewes for the same parties, viz, "the Massachusetts Association for Promoting Agriculture," and they were so pleased with what we had done that they sent me a very handsome present.

The insurance against the total loss of the steamer is trifling—same rate as on ordinary goods—but against accident, either in shipping, on board, or on landing, it runs very high, sometimes as high as 10 or 15 guineas per cent. We have always victualed for twenty-five or twenty-eight days, according to the season of the year. Such may seem absurd, but it is on the safe side. Cattle steamers coming to Europe have nearly always something on board upon which they can fall back, such as grain, Indian corn, flour, &c., but outwards there is nothing of the kind.

Again, as to the man in charge of the animals, we have two or three first-class men, men who are constantly crossing with cattle, and they frequently call in to know if we have anything going. These men, being good sailors, do not suffer from sea-sickness, and consequenty can always be at their post. Five pounds is the general payment. I find we disbursed nearly £700 for the last lot of sheep—ewes. I have only lost one horse—a large, heavy stallion—which, however, was no fault of mine, as he was of a fretful temperament, and very shortly after a gale of wind sprung up he died. The following is the memorandum above referred to:

Expenses of the shipment of two horses in May, 1883.

	£	s.
Freight out, £10 10s. each	21	0
Groom's passage	4	0
Victuals for twenty-five days: 732 pounds hay, 168 pounds straw, 2 sacks sawdust, and sacks	4	0
300 pounds crushed oats, 260 pounds bran, 10 pounds linseed, sacks &c	3	0
Cabbage, carrots, and turnips, or roots		10
Ironmongery: Fork, bucket, scraper, basket, comb and brush, &c		15
Stalls, very strong, padded, with mangers, &c	5	5
Slings, extra strong	2	10
Leather halters and ropes		10
Incidental expenses: Livery stables, groom's board and lodging, men leading to stables, and next day to steamer (4 miles), cartage, porterage, provender to the dock, men at steamer assisting in shipping, &c	3	10
Consular invoices (breeding purposes), 5s., say; consular fee, 15s	1	0
Entry at customs, dues, bills of lading, and insurance (against total loss of ship only, and not against accident)	1	0
Agency: Attendances, fixing steamer, and freight at dock, and stalls, superintending shipment, early or late, from £3 3s. to	4	4

Messrs. Flinn, Main & Montgomery, the managing directors of the Mississippi and Dominion Steamship Company (Limited), of Harvey Building, 24 James street, Liverpool, state that the rate of freight averages from four to five pounds per head, which includes the cost of the stalls and fittings used on the steamer and the supply of fresh water during the voyage. Fodder and attendance are provided by the shipper, and an attendant is allowed free for every 25 cattle. As to cost of maintenance during the voyage, Messrs. Flinn, Main & Co. are unable to give any certain information. The loss from mortality by this company's vessels is very slight. Out of 1,343 head of prize breeding stock carried to Quebec during the summer of 1883, only 4 died, and during the winter months they have been carried with equal success.

The stalls are placed on the main steerage decks. Their average size is, for a single horse, 8 feet by 4 feet, such stalls being always padded. Cattle stalls are constructed so that each shall hold two animals, and their size is usually 8 feet by about 5 feet 6 inches. These are the ordinary sizes, but special arrangements can be made to have the stalls arranged for any particular lot, as shippers may desire. For shipping by this company's line, or in fact by most of the Atlantic lines, the Alexandria dock station of the London and Northwestern Railway Company is the most convenient, and cattle should be sent forward the day previous to the ship's sailing date.

NOTE.—For convenience, wherever pounds, shillings, and pence occur the pounds may be reckoned at $5, the shillings at 25 cents, and the pence at 2 cents.

BRITISH CATTLE MARKETS.*

REPORT BY CONSUL RYDER, OF COPENHAGEN.

The attention of the Royal Agricultural Society of Denmark having frequently been called by many of the district members to the great want felt by the agricultural classes for full and trustworthy information on this subject, it was determined by that society in the course of last year to send over a duly qualified expert to examine closely into the workings of the English markets, as well as into the general requirements of the trade, and the results of this official's investigation have now been made public for the benefit and guidance of the agricultural community.

In furtherance of the objects in view two market places in London, two in Newcastle, and one in Edinburgh and Glasgow were visited, and it is remarked in the outset with much truth that in order to obtain a proper insight and become fully acquainted with the systems of these markets, to which are forwarded a large number of cattle of considerable money value from this country, it was first of all felt to be of primary importance to seek for full information regarding the different classes of customers at these markets and the demands made by them, as constituting one of the essential points of investigation.

At Newcastle the markets were found to be held on Mondays and Tuesdays of each week, on the first day the market being held in the cattle stalls; on the second in the open market place. On the Monday the buyers were traders from distant places, viz, from Manchester, York, Leeds, from the borders of Scotland, and even from London. From Manchester, which has a cattle trade of equal importance as London, come the largest number of buyers; wholesale dealers who purchase in large lots, never less than a railway-wagon load, and, as a general rule, nearly half the cattle is bought up for that trade center. Though Manchester, from its adjacent position to Liverpool, the chief receiving port of the United States imports, this market of Newcastle is always greatly influenced according to the extent of the American imports. On the Tuesday, on the other hand, the market is generally attended by the local butchers, as also by the butchers from the neighboring towns in this thickly populated district. Tuesday may thus be regarded as a day of retail trade, inasmuch as each butcher only buys a couple or at most from six to eight head; but on this day there is generally a very brisk trade, a large number of beasts are disposed of. Finally, there is a third class of buyers, but these are more uncertain in their dealings, namely, the traders from London, so-called cayo butchers, who look out for the large and coarser kinds of animals, to sell these again to the great sausage manufacturers.

In comparison with Newcastle the London market ranks poorly in regard to the numbers of customers for the Danish cattle. The chief buyers in this market are the wholesale butchers from the western part of the city, the Whitechapel butchers, who buy up a fair amount of these cattle, one individual taking at times from one hundred to one hundred and twenty head in the week. These purchase the inferior, large-horned animals, but at the same time require them to be of a perfectly sound condition. They purchase

*Republished from Consular Reports No. 53.

chiefly for the Jewish population, who buy the forequarters, whilst the hindquarters are sold in the meat markets.

Another class of customers are the country butchers from Kent. These buy the large animals of best quality, especially young and fat heifers. Individually they do not buy in large quantities, but still the number sold to them on the whole is far from inconsiderable. The third class of London customers are the large meat contractors for the army and navy services, the hospitals, &c. These are, however, a class of buyers of very uncertain nature, inasmuch as they can often remain away for a lengthened period of time; but then when they do make their appearance they can purchase on a very extensive scale; frequently a couple of thousand head, one individual contractor having been known to purchase twenty-two hundred beasts in the course of two days. They are, in consequence, held in dread by the other classes of customers, whilst they are, on the other hand, most heartily welcomed by the commission agents. This class of customers as a rule confine their purchases to beasts of somewhat inferior description. Finally a fourth class is to be found in the retail butchers, of which there are a large number; but these, unfortunately, it would seem, are, with great difficulty, reached by the importers of Danish cattle. They dwell chiefly in the eastern quarters of the town, and only buy animals of best quality, but, as before said, they are very difficult to approach, and when they do come to our agents they only buy of the very best, and, on the whole, do not seem to favor our cattle, but prefer keeping themselves to their home breeds.

To the market of Edinburgh, or, one should rather say, Leith, which is the port of entry, and suburbs of that city, comparatively few, and all lean, cattle are sent from this country, and it may be said that this market has never met with much success. The trade is here, for the greater part, carried on at public auction, held in a large building belonging to the commission agents, who are mostly moneyed men and few in number, and the market would almost appear to be greatly ruled by some of the leading men.

The system of auction may undoubtedly be equally as advantageous as that of selling by lots, nevertheless it is the general opinion that the prices in the Edinburgh market were more fluctuating than in the others. Both in the Newcastle and London markets the supplies have increased enormously in the last ten or eleven years. In the year 1872 there were imported into Newcastle from foreign lands 96 head of cattle; in 1878, 28,990 head; in 1880, 55,800 head, and in 1883, 104,300 head. It cannot therefore be a matter of surprise that under so rapid development a system of conducting the trade should have arisen which should not be allowed to exist.

Several bad customs have crept in which are now difficult to combat, but which may ultimately prove of serious detriment to the trade unless a firm stand is taken in time against them. For example, it is now of very common occurrence that the commission agent, so as not to cause dissatisfaction to his constituents when he has made sales at low prices, is in the habit of adding to the price at his own cost, whilst on the other hand he makes a deduction from the prices obtained when he has succeeded in effecting sales at unusually favorable rates. Again, these agents frequently have their subagents in the kingdom, to whom they make a pecuniary return for each animal which is forwarded to them through their influence, and which must in the long run come out of the pockets of the farmers. Another objectionable practice is that of long credits too often given by the commission agents in order to secure customers, but which can at times be the means of entailing loss to the farming classes at home; and again, the large advances which are also frequently made by these agents to cattle dealers in the kingdom (the middle men) are likewise the means of creating an amount of uncertainty in the trade. These large advances too often lead to extensive speculations being carried on, which in a great measure place the farming classes at the mercy of these traders. These middle men again are also too often in intimate connection with the forwarding steam company's agent.

All these excrescencies only tend to injure the vitality of the trade, and in all probability the only correction against such abuses will be found in "combinations" by the farming population to protect their interests, as also by transacting their business with agents of their own choice.

Another great factor in regulating the state of the English markets is to be found in the different relations with our competitors in the trade. The nature of this competition is to be seen from the imports from the different countries. Thus the imports from Denmark which in 1874, were 26,800 head of cattle, in 1883 had reached up to 119,300 head, while the exports from France are very inconsiderable, amounting yearly only to about 3,000 to 4,000 head. But owing to the outbreak of the cattle plague the imports from this quarter have been completely stopped. From Schleswig-Holstein the exports were gradually on the increase until 1876, when they had obtained the number of 51,000 head, but now that cattle from these places are required to be slaughtered at Deptford, the exports have continued to decline so that in 1883 these exports amounted to only

28,000 head. Holland, also, like the two before-mentioned countries, received a blow in 1877, when the free import of their live-stock was also restricted, the exports from that country, which in 1876, amounted to 86,000 head, being reduced in 1883 to only 40,000 head; but on the other hand the imports from Spain, Portugal, and Sweden have been on the increase, and, as might be expected, it may be accepted as a rule that the exports to England from all those countries enjoying the privilege of free imports have been on the increase, while a considerable falling off is to be noted from those which are placed under the slaughter regulations at the port of import. Of the countries outside of Europe it is seen that the exports from Canada, which first took its commencement in 1875 with about 200 animals, in 1877 had already increased to 7,000, that it has now attained the large development of 50,000 head. From the United States, while the export to England in 1874 was also only about 200 head, these have likewise increased to a considerable extent, as will be seen from the following tabular statement, viz:

Year.	Exports.	Year.	Exports.
	Head.		*Head.*
1877	11,000	1881	108,000
1878	68,000	1882	47,000
1879	76,000	1883	155,000
1880	154,000		

The annual imports of live-stock into Great Britain during the decade of 1874-1883 have been increased from 193,000 head to 367,000, of which the United States of America and Canada have shipped about one-half and Denmark one-third.

In the imports of sheep Germany and Holland occupy predominant positions, these countries exporting annually from 200,000 to 300,000 to the English markets. The exports from Denmark have likewise been steadily on the increase, amounting in the past year to 90,000 head. The sheep trade, in opposition to that of horned cattle, is found to meet with most success at the Deptford market.

Of the fresh-mutton trade the imports for the past five years were as follows, viz:

Countries.	1880.	1881.	1882.	1883.	1884.
	Cwt.	*Cwt.*	*Cwt.*	*Cwt.*	*Cwt.*
Holland	87,500	105,000	123,000	83,100	56,800
North America	.....	.....	29,000	41,400	20,800
Australia	.....	.....	37,200	103,600	147,800
South America	.....	.....	.....	6,100	24,300
Russia	.....	.....	.....	400	.....
Total	87,500	105,000	189,200	234,600	249,100

These figures afford a good indication, and account for the reduced prices of this article of food. During the past year especially the sheep trade has been subject to great depression, owing to the largely increased imports of frozen meat, and, unfortunately for the sheep-owners in Europe, there is all prospect of those imports meeting with much greater development in the near future.

The importation of fresh and salt ox meat can date its commencement from the United States of America in 1875, and from Canada in 1876, the exports from the latter country in the year 1883 having reached up to 34,000 cwt. In 1875 the United States only exported 3,000 cwt., in 1877 these had already increased to the large amount of 443,000 cwt., and in the subsequent years these have further increased as follows, viz: In 1878, with 483,000 cwt.; in 1879, with 559,000 cwt.; in 1880, with 724,000 cwt.; in 1881, with 747,000 cwt.; in 1882, with 446,000 cwt., and in 1883, with 730,000 cwt.

As will be observed from these tabulated returns a considerable decline is to be noted in the exports from the United States in 1882, both of live stock as well as slaughtered meat, and it will thus appear that notwithstanding its large supplies, the United States have not yet been able to bring down prices, like as in the grain markets, to such a point as to exclude from the markets their European competitors; but rather that the extent of these exports is more dependent upon the condition of the home prices in our country. Thus, for instance, from 1876 to 1879—when a steady reduction in meat prices was felt in the United States, especially for the first and second class qualities, owing in a measure to the diminished home consumption consequent upon the unfavorable condition of the working classes in the foregoing years and due also to the introduction at that period of the short-horn bull breed for crossing purposes—a large increase of meat products both in regard to quality as well as quantity took place, which led to the rapid development of the export trade in those years; and here it should not be omitted to mention

that the great development in the fresh-meat trade is essentially due to the great improvement made in the methods employed for the safe carriage of these articles over long sea voyages. Dry air in cooled compartments of the ship is now used for the full preservation of the meat, and this has now been brought to such points of perfection that slaughtered meat can in these days be brought in sailing ships from the Australian colonies and delivered to the English markets in excellent condition.

A sudden perceptible decline on the other hand becomes apparent in the exports from the United States, when prices at the close of 1881 at Chicago and through the first half of 1882 met with an advance of some 40 to 45 per cent. on the better qualities of meat, due in part to the loss of a large number of animals in several of the Northern States during the previously severe winter, and more especially to the enhanced cost of feeding, resulting from the bad cereal crops in the previous year.

The chief effect of this largely diminished supply from the United States in 1882 was a corresponding impetus given to increased supplies from other exporting cattle countries, so that even Germany in that year was found to take part in the export of slaughtered meat to England. The imports of live stock into England from Denmark, as will be observed from the foregoing tables, has been steadily and largely on the increase, so that this country may now be considered as taking a prominent position in two of the markets. During the latter years a much larger number of young animals have been sent away than was formerly the case, and at the same time it has to be noted that these increased exports will be found mainly due to the larger exports of cattle in lean or half fattened condition. In fact, it may be stated that the great change which has been made is that in place of sending their cattle as in former years to the marsh lands for fattening purposes, these are now sent to England, whilst the exports of fattened beasts have not increased to any extent worth mentioning. It will undoubtedly seem strange that a country like Denmark, which from olden times has been an agricultural and cattle-raising land, has not made further progress in the fattening branches, whilst the English farmer, within these times subject to a severe competition and pressure, only disposes of his animals when in fully fattened condition, and which he must find out without doubt is most to his advantage.

The fattened beasts sent from this country are forwarded by a limited number of the most intelligent and enterprising of the farming classes, who have made themselves fully acquainted with all the requirements of the English markets. The causes of this unsatisfactory state of things are perhaps manifold. One of them without doubt will be looked for in the backward state of the root culture in this country, as fattening with grain or other costly feeding stuffs can only become profitable up to a certain point. It may also be partially due to the slow fattening properties of Danish cattle. And again there are always to be met with large numbers of cattle dealers (the middlemen) traveling through the agricultural districts, who exert all their influence to induce the farming classes to part with their live stock, and in this way, without question, a course of fattening is too often interfered with.

In the concluding remarks of the report the Danish agriculturists are at the same time strongly recommended to give greater attention to the improving of their cattle breeds by introducing of good short-horn bulls for crossing purposes, as it would appear to be a general complaint that the Danish breeds do not furnish an equal amount of meat, neither do they fatten in so short a space of time as the short-horn breeds, and it has farther been seen that more favorable prices have been obtained in the English markets on the exports of crossed-bred cattle than for those of the pure Danish breeds; thus it is mentioned that in the spring of last year, 10½ cents per pound was obtained at the Newcastle market for some beasts of cross breed, while on the other hand no more than 8 cents were realized for the animals of pure Danish breeds.

HENRY B. RYDER,
Consul.

UNITED STATES CONSULATE,
Copenhagen, January 26, 1885.

THE BELGIAN PROCESS FOR THE PRESERVATION OF FRESH MEAT.

INCLOSURES IN THE CATTLE REPORT OF CONSUL TANNER OF VERVIERS AND LIEGE

REPORT OF FIRST COMMISSION.

We, the undersigned—A. Thiernope, member and secretary of the Academy of Medicine, veterinary of the State; Professor Ruge Courtoy, chemist; A. Reul, repetitive at the said school; A. Van Schelle, avocat at Brussels, and J. Limbourg, veterinary surgeon, inspector of the meat market at Brussels for the Government—members of a commission constituted for a process for the preservation of fresh meat invented by Dr. Closset, of

Liege, assembled in the laboratory at Liege, January 20, 1883, to witness the method of Dr. Closset, declare:

This method consists in preserving fresh meat in an artificial air. Four pieces of fresh meat—a rib of beef, a round of veal, a leg of mutton, and a shoulder of pork—were placed, separately, in air-tight tin boxes, which were deposited in the glazed cellar of the laboratory of Liege. Then we reassembled on the 22d of February, a good month afterwards. The boxes, identically the same, were opened in our presence, and we protest that the meat was preserved perfectly fresh, not even having the look of frozen meat, which, when thawed, looks repulsive and becomes soft and moist and loses its fine qualities in the eating. Having cut the meat, we found the fat, the tissues, the bones, and the marrow of the bones, even the blood, extracted from certain parts of the pieces, perfectly fresh.

After these different experiences we tasted some slices, after having had them cooked naturally, and we were struck with their taste and their tenderness. They had acquired that degree of tenderness, by their being deprived of air and being pressed, which is a condition necessary for an easy digestion.

These pieces of meat have been hung in a triangle in the glazed gallery above mentioned, exposed to the south; we have observed them every day till the 6th of March, and we have found them totally free from corruption and very wholesome, consequently we declare the process of Dr. Closset perfect in the aim proposed.

REPORT OF SECOND COMMISSION.

Experiments made at the slaughter-house at Liege on the 9th of March, 1883.

In presence of Mr. L. Browier, medicine veterinaire, director of the slaughter-house at Liege, also inspector of the butcher-market of Liege; L. Dejuce, doctor; A. Ansiant, avocat, and A. Darvans, industriel, in whose presence was made the following experience.

Two huge pieces of beef and of veal were inclosed separately in two boxes by Dr. Closset, according to the system of which he is the inventor.

The first box containing the veal was opened after three weeks; the meat after being exposed to the air was still intact, and continued so eight days after being taken out of the box, in all, forty-six days after being killed. The meat in the two boxes presented a natural color and spread a fresh odor, and when cooked had exactly the taste and smell of fresh meat. In a word, its physical qualities were those of fresh meat; which is certified by the numerous witnesses present, among whom were Messrs. Nelf-Arban, reprisentant; Jules Frisart, bornquier; D. Closset, industriel; de Vaux, engineer; Delorme de Nossius, bornquier, &c.

What is above all to be remarked is that after being taken out of the boxes the meat can stay exposed to the air, without losing any of its qualities, ten or fifteen days, and which in all the other operations hitherto tried the meat must be eaten immediately after being exposed to the air.

REPORT OF THIRD COMMISSION.

Report of the commission to which has been referred the account of Mr. Closset, entitled "A study experimental of the possibility of the preservation of meat, fresh, from beyond seas for animal food in Europe."

GENTLEMEN: I have the honor of giving you an account of the examination we have made, M. Dessaire and I, of the report addressed to the company by Mr. Closset, doctor of Liege, having for title "Experimental study for meat from beyond seas, fresh, for animal food in Europe."

In the actual social condition of Europe, animal food for the working class is absolutely necessary. It is also clearly shown that in the middle and southern part of Europe the production of cattle is far from sufficient for the animal food of its inhabitants. After having shown the benefit it would be for the health of the working classes, wholesome animal food to repair their wasted strength daily, and which at the present time is so far above their means of procuring.

If our population suffer at the present day from the want of that food, there is but one means of remedying the evil, that is to discover a process by which fresh meat can be exported from beyond seas, produced from the numerous flocks and herds there superabounding. After numerous trials, of which he has given a short account, it seems he has realized all the required conditions of preserving the tissues, muscles, fat, and bones in their natural freshness without introducing any strange substance. This process in fresh meat being inclosed in air-tight tin boxes, after the manner of Mr. C., the meat loses none of its freshness either in color or taste; at least this is the result as shown to us of the veterinary laboratory belonging to the State, composed of Messrs. Thiernepe, Van Schelle; Limbourg, inspector of the markets at Brussels; Coartoy, professor; Burt & Mussulman, reporters at the University.

After having assisted at the preparation of five tin boxes, containing large pieces of beef, mutton, veal, and pork, the commission above named has seen, after thirty-two days, the meat come out as fresh as when it was put in, losing nothing either in color or taste.

We believe it useless to insist further on the consequences of Mr. Closset's discovery or the effect it will produce on our working population, a plentiful supply of wholesome animal food. Considering the importance of this communication, we have the honor—

I. To address thanks to the author.

II. The insertion of his work in the Bulletin.

These conclusions are adopted.

FEEDING CATTLE ON THE SOILING SYSEM.

REPORT PREPARED FOR CONSUL SHAW, OF MANCHESTER, BY MR. JAMES LONG, OF HETCHIN, ENGLAND.

The soiling system, or the feeding of green crops where they are carried to the yards or houses for the animals from spring to autumn, has been too much neglected in England, perhaps owing to the excellence of our permanent pastures. Professor Brown, of the Agricultural College, Ontario, has paid much attention to this system, and he estimates the proportionate feeding values of various green foods as follows: Green fodder from good pasture having a feeding value of 40, that of lucern is 38; of sanfoin, 28; red clover, 31; prickley comfrey, 27.

The best green food for soiling, therefore, says Mr. Evershed, a well-known English authority, is the produce of rich pastures, and Professor Brown recommends for Canada the cultivation of other soiling crops only because the pastures of that country are unreliable for continuous progress in the production of beef or milk. The rich old grass lands of England cannot be secured there. The droughts and frosts of an extreme climate prevent the growth of that excellent variety of pasture plants which secures a close bottom. There may be rain enough, but it is not properly distributed so as to supply what the professor calls the "regular top-dressing which is essential to continuous greenness." Hence the farmer himself must "make good the balancing of things that have been displaced in nature" by the growth of crops suited for soiling. Mr. Brown does this at the college farm successfully; "and with such a sun as ours," he says, "enormous agricultural wealth may be attained by the production of repeated crops of fodder by means of the plants just named. I have no doubt the old turf of England has discouraged the practice of soiling, and I think we shall find that the same advantages attend the system here as in Canada."

But first let me borrow a leaf from Mr. Brown. He sows down 20 acres with soiling crops in a 100-acre farm, and grows 234 tons per annum of green forage, the lucern yielding 16 tons per acre; the sanfoin 6 tons; the red clover, 7 tons; mixed tares and oats, 6 tons; prickly comfrey, 10 tons; cabbage, only 12 tons. The average is less than 12 tons per acre, and I think that in England the general average would be a great deal more. Each animal consumes 100 pounds of green fodder daily, with other food, according to circumstances, so that 26 head would be maintained on the 20 acres during the six months when this forage is available, or about one-and-a-sixth animal per acre as against one animal on 3 acres of permanent pasture. In Canada, it seems, animals fed in a 20-acre pasture walk several miles a day searching for a bellyful. Half the animals on Mr. Brown's 100-acre farm are kept for feeding, the rest for the dairy. He gives some of the fodder to his horses and pigs, and maintains with the rest twenty cattle instead of twenty-six, as he might do. In fact, by setting aside 20 acres in 100 acres, he claims to

keep twenty cattle instead of seven, the usual number found on a farm of that size. The financial results of soiling 20 acres of forage during six month are:

Ten fattening cattle (108 tons fodder at $2.15, $232; attendance, $50)	$282
Two milch cows (86 tons fodder, $184; attendance, $40; milking, $20)	244
Outlay	526
Increase on 10 cattle, $5 per head per month	300
Manure	50
Milk from 10 cows, 180 days, 10 quarts at 1¼ cents	225
Manure	40
Forty tons fodder to other animals	86
	701
Balance profit	175

These figures are offered merely for the sake of comparison. They show that Professor Brown obtains for rent and profit about 35 shillings per acre, the value of the land being less than 15 shillings an acre. He charges against the land about 9 shillings per ton as the cost of the forage or about £5 5s. per acre, the yield of the crop being less than 12 tons per acre. He sells the milk at a halfpenny and an eighth per quart, and his cattle increase in value about 5 shillings per week. In England all the figures must be altered to adapt them to the very different circumstances, and each person who adopts the soiling system must alter the figures according to his own particular circumstances.

One of the most successful examples of soiling that I have ever seen was on rich land on the south coast, near a large town and in mild climate. The value of the produce on milk and butter is at least four times as great as in the example I have just offered, and the yield of forage per acre is quite 50 per cent. higher. Every kind of forage which is usually found on fertile land, or which Mr. Brown has mentioned, grows well except sanfoin and prickly comfrey, which have not been attempted. Lucern, which is the best soiling crop of Canada, flourishing under a hot sun, yields more than the 16 tons an acre which Mr. Brown no doubt correctly attributes to it. Cabbages, for which he only claims 12 tons an acre, yield 40 tons, and though they are hardly a "forage crop," they are one of the most useful and quite the most productive of the soiling crops. Another advantage on the same farm, with its warm, deep soil and sheltered aspect, is the extension of the season. Trifolium, a prominent crop in the district, is nowhere forwarder, and the permanent pastures, which are mown for soiling at any time when required, are nowhere later in their growth.

To carry out the soiling system advantageously we require green crops, and several sorts of some of them, early and late, so as to extend the period of feeding, and to prevent the occurrence of gaps in the regular provision of food. On the farm in question there are four sorts of trifolium—early, late, later, latest—the last named being a recent acquisition, and a timely one. There are two sorts of red clover blossoming this year (1883) about June 20 and July 5, and the earlier of these is now (July) entirely saved for hay, the introduction of the "later" and "latest" trifolium having extended the trifolium season into the middle of July, when pastures follow, and other succulent food, such as cabbages, becomes abundant. A debtor and creditor account for this farm, if I could offer one, would no doubt be interesting, but it would not be so edifying as a similar account for his own farm by any agriculturist who may try the soiling system. It is certainly profitable on this farm, and will prove so elsewhere, in a degree varying according to soil, climate, management, and the value of the produce. The cows on this farm are nearly all of the Alderney breed, and they are fed with corn, bran, and cotton cake, in addition to their green food; and as the sale of butter removes from a farm less of the soil constituents than any other kind of farm produce, and as hay and roots, which remove in their sale more than wheat or barley, acre for acre, are rarely sold, the land grows richer year by year. It is admitted that the site is favorable for soiling; but the system succeeds on very different sites—where the rent of the land is twenty or twenty-five shillings per acre instead of three pounds, as in the case of the farm just noticed.

On a cold, poor hill, where Alderney cows would perish, I have known a very successful example of the system here recommended. The forage crops were different. Lucerne was replaced for sanfoin, and tares sown for succession, and "seeds," mixed clovers, and rye grass were prominent. The kind of produce in this case is young beef, highly fed from calfhood, and the calves reared at home at the homestead under the hill.

There are certain great advantages attaching to this system, especially in the case of all mature animals, fatting cattle, and milking cows. Young animals will be better in

the field as a rule, unless they are to be fattened and killed young; and in that case the soiling system is most successfully applied, as it is in the case of growing pigs, which are not a very desirable kind of stock to ramble in the fields, and are very properly fed in yards. In the case of small farming, the soiling system is specially adapted to the circumstances that usually obtain on small farms, and therefore in many parts of France and other continental countries it prevails. In the wine districts you will find it universal, and very properly so. The manure goes chiefly into the vineyards, and it is produced under the soiling system by cattle bedded with the straw of the grain crops. A poor, unmanured pasture would only maintain about one cow per acre, but the green forage produced on a single acre of the several grain crops will suffice for three cows.

Both on small and large farms animals are fed on this system through the summer with obvious advantage in several respects. They are kept in the cool, and are spared the annoyance of flies, which in some districts are particularly harassing. Their food is used with economy; and instead of having to wander for miles to and fro, as they do sometimes on poor pastures, to obtain half a bellyful, the nourishing and bulky succulents which they love are brought to them and they take their fill in comfort. Then, the crops they are fed on are of the most productive kind. They are grown with the greatest economy of land, and there is no tramping under foot of the herbage in its consumption nor fouling it with excrements. In most situations from two to five times more cattle can be kept by soiling than by depasturing; and it is a point worth notice that much second-rate pasturage can only be grazed in summer by lean stock, owing to the annoyance of flies in some districts, and that corn would be thrown away if it were given to the animals under such circumstances. This refers especially to the drier and hotter parts of the country which are least adapted to natural pasturage; and these are the districts where soiling offers most advantage.

The soiling system is practiced more generally than in any other country, and there cut grass is brought to the cows all the summer—mowing often extending over four and even five times—but it is regularly followed with liquid manure. In England, as a rule, the holdings do not permit of such heavy manuring of grass land, but where it is conducted there is saving of time and better crops, especially on heavy soils which drain better without the weight of cattle continually upon them. Hedges and ditches and drains are also much less troublesome, but against this there is the labor of extra mowing.

MIXED FOOD FOR CATTLE.

REPORT PREPARED FOR CONSUL SHAW, OF MANCHESTER, BY MR. JAMES LONG, OF HETCHIN, ENGLAND.

The following specimens of mixed foods for fattening bullocks were last year collected from the Highland and Agricultural Society's members. A number of my correspondents have kindly supplied me with a statement of the diet on which they are accustomed to feed their cattle—both feeding animals and stores—and we proceed to give specimens of these. It will be seen that in every instance very much less weight of turnips is allowed than the beasts would consume if an unlimited supply of bulbs were placed before them.

Mr. Buttar, Coupar-Angus, gives his feeding cattle the following mixture, costing 10 pence, or thereby, daily:

	Pence.
15 pounds cut straw	—
56 pounds (½ cwt.) turnips (pulped) at 6*d.* per cwt.	3
2 pounds linseed meal at 1½*d.* per pound	3
4 pounds cotton-cake (decorticated) at ¾*d.* per pound	3
1 pound treacle (diluted) at 1*d.* per pound	1
	10

The above is given in three feeds, and after a time the richness of the mixture is increased by adding cut grain, such as oats, beans, and maize, to the extent of about 3 pounds, costing about 2 pence a day extra, bringing up the cost of feeding to a shilling per day exclusive of straw but inclusive of roots. Mr. Buttar thinks that 2 cwt. of turnips would be consumed by a fair-sized bullock, if getting nothing else except straw, which at 6 pence per cwt. costs the same as the richer of the above diets. He adds that even with all this quantity of turnips it is difficult to turn out a well-finished

beast without a little cake and corn in addition. Mr. Buttar's diet for young store-cattle is as follows:

	Pence.
15 pounds cut straw	
28 pounds (¼ cwt) turnips (pulped) at 6*d.* per cwt	1½
1 pound linseed meal, at 1½*d.* per pound	1½
3 pounds cotton-cake, undecorticated	2
1 pound treacle, at 1*d.* per pound	1
	6

Mr. Buttar's testimony is to the effect that in the above mixture, costing 6*d.* daily, his stores are kept in much better condition than 1½ cwt. turnips, which at 6*d.* per cwt. would cost 9*d.*

Mr. Dalziel, Dumfries, at the commencement of the season, places his feeding cattle on the following allowances: 56 pounds turnips, pulped and mixed with chaff, 2 pounds linseed cake, 2 pounds Waterloo cake, and 4 pounds Indian meal, well mixed with hot water. After two months, a pound of cake and a pound of meal additional are given. The average expense of the supplemental food is 1*d.* per pound—that is, 10*d.* daily, or 5*s.* 10*d.* per week for each beast when the animals are on full feed. Long straw *ad libitum* is also at the command of the cattle. Mr. Dalziel is of opinion that if ¾ cwt. of turnips were given instead of ½ cwt., the cattle would not make so much progress. We have already referred to the experience of Mr. Bryce with cut hay, oat straw, or wheat chaff. Many years ago, that gentleman informs us, he used to make bullocks very fat on Swedish turnips and wheat straw, an unlimited supply of each; but on this diet it took about eight months to make his cattle ripe for the butcher. Now he succeeds in making them equally fat in one-half the time by feeding them according to the following system: He pulps the turnips and mixes them, and adds 2 or 3 pounds per head of corn meal, the whole being allowed to stand for 24 hours to allow the meal and chopped fodder to become thoroughly saturated with the moisture from the turnips. The beasts are fed three times a day with this mixture, two and three year old bullocks getting about 80 pounds and younger cattle 60 pounds each. In addition, from 4 to 6 pounds of linseed cake (home made) are allowed per head, according to age, with an ordinary allowance of fodder.

Mr. Wilson, Ballencrieff, arranges his cattle in different sets of courts, according to their forwardness of condition, and his scale of allowances in food is a graduated one, a different quantity being given to each set. When the courts containing the first quality of beasts are cleared they are refilled from the second courts, and so on. The following is the usual scale of daily allowance for each lot:

First, or more advanced lot.

	Pence.
10 pounds chaffed clover hay, at £4 per ton	4½
56 pounds (½ cwt.) turnips at 6*d.* per cwt	3
4 pounds linseed-cake, at 1½*d.* per pound	6
5 pounds mixed meal, at ½*d.* per pound	2½
	15¾

This it will be seen is exceptionally liberal feeding, but Mr. Wilson from his business in Edinburgh has special reasons for desiring to have command of the highest quality of beef.

The second courts are getting the following diets each day:

	Pence
5 pounds chaffed hay, at £4 per ton	2
5 pounds straw chaff, say	1
84 pounds (¾ cwt.) turnip, at 6*d.* per cwt	4½
2 pounds cotton-cake (undecorticated)	1½
3 pounds mixed meal, at ½*d.* per pound	1½
	10½

The cost is here about 10½*d.* per day. No straw is given as fodder, but the cattle are roughly littered. In comparing the outlay on Mr. Wilson's cattle with others, it should be noted that an estimate is put on fodder in the former case which has not been calculated in the latter.

FARMING IN BELGIUM.

(M. FRANÇOIS FLECTRET TO CONSUL TANNER.)

The system of managing cattle which is practiced by our farmers has been in use among them from a very early period, and the neighboring cantons of Limburg, Verviers, Dison, Fléron, and Dalhem have likewise adopted it; it is the only one of this kind adopted in Europe; it is so arranged that all the cows calve from February 1 to May 1.

Any cow not with calf by August 15 is fattened and sold to the butcher in autumn. Sometimes, if she is a first-rate milker, the farmer winters her, gets her milk, feeds her with meal and good hay, and in the month of March she is in fit condition to be sold to the butcher.

Intelligent farmers take care that cows that have calved in March and April shall be well fed with meal, oil-cake, and the best of hay, so that they may be in good condition when they are turned out to pasture early in May, according as the spring is more or less advanced. All who are able to appreciate the value of permanent grass will readily understand how abundant must be the yield of good milch cows when allowed to graze in our rich old green meadows. After they have been in pasture for some days, they are no longer housed; they remain all night in the meadows until the month of December, or rather until the grass is entirely covered with snow.

The cows are milked three times a day for six months; the first milking takes place at 4 o'clock in the morning, the second at 11 o'clock, and the third at 7 p. m. During the months of April and November, and a part of March and December, they are milked but twice a day; the intelligent farmer always manages it so that each animal has a rest of at least two months from the day when she is last milked until calving time. This is done so that she may not be exhausted.

Not only do the farmers' wives, daughters, and maid servants milk the cows; the farmers themselves, their sons, and men servants are not ashamed to perform this task.

The proper milking of a cow is a scientific piece of work; it requires considerable strength in the wrist, for not a drop of milk should ever be left in the udder, for the very good reason that the milk is in the udder as it is in a milk-pan; in the cream-pan the cream is on top; it is, therefore, readily seen that the last tenth of the milk extracted is the richest fraction that the udder contains.

It is not long since many land-owners bought cows that were not with calf, in the spring, and fattened them in their rich pastures.

A farm of ten hectares (25 acres) afforded pasturage, early in May, for twenty-five animals, some of which were fat by the 1st of July, especially those crossed with the Durham breed; these cattle have always been found superior to the Dutch and native breeds, as regards fattening qualities. It was considered that the land-owner made a profit of 150 francs ($30) on each cow, which made a total profit of 3,750 francs ($750). This practice has been given up since the price of butter has exceeded 3 francs per kilogram. Two or three cows in process of fattening are still found here and there among a herd of milch cows, but no farm is now entirely devoted to the fattening of meat-cattle. The flesh of a cow from four to five years old, fattened in the rich pasture of Herve-Aubel, is far more tender and succulent than that of a fat ox six or seven years old.

The breed of our province, which was originally very good, has been improved by an admixture of Durham and Dutch blood. A number of Durham bulls have been kept at Battice, Teuven, Sippenaeken, and Wegimont, near Herve; thousands of calves of both sexes, sired by these bulls, have been reared and disseminated throughout the district.

The farmers always select their cows with great care; they place a very high value upon good milk-producing qualities, and it is not uncommon to meet with cows that give milk enough in one day to make a kilogram (2¼ lbs.) of butter, and even more. The success of the farmer depends, beyond a doubt, upon a judicious selection of his cattle.

The cows most sought after in the spring are those which have calved for the first time, and whose age is about thirty months. These animals, if they have been raised in third or fourth rate meadows, develop admirably in first-class meadows, and become splendid milkers. Four thousand francs are not unfrequently paid for a cow thirty months old that has had her first calf.

There are in the district magnificent animals of the pure breed of the country; their form is highly symmetrical and their frame is in no way inferior to that of Durham or Dutch cattle.

These cattle of our district are usually excellent milkers. It is consequently much to be wondered at that our farmers, who are so intelligent, economical, and mindful of their

interests, do not form an association for the purpose of improving the breed by means of selection. To attain this end it would be sufficient to select the most highly improved cows, to procure a bull irreproachable in all respects, and to raise twenty or more calves every year. These calves at the age of one year would be sold to the highest bidder, and repurchased by the parties who had raised them, or by their neighbors, an estimate having previously been made with a view to indemnifying the raiser for the expense incurred by him in keeping the animals from the time of their birth to that of the sale.

About thirty years ago farmers raised no calves, for the reason that they were able to purchase in the breeding districts excellent milch cows for from three to four hundred francs (sixty to eighty dollars); but since the average price of first-rate cows has risen to 500 francs ($100), and is sometimes even upward of $600 francs ($120), they have taken up cattle-raising, and they have acted wisely in so doing, for, as they raise none but calves whose dams are first-class milkers, they thereby perpetuate the good milking qualities of their herd.

Although bulls begin to leap at the age of eighteen months, the calves produced by them at that age are generally excellent. The number of these breeding animals has doubled in the last few years. There is now scarcely a farmer owning ten cows that does not keep a bull. He thereby secures the following advantages: There is no necessity of removing the cows to a distance for the purpose of mating, and the probability of a cow's conceiving is much greater than when she is taken to a bull exhausted by too many leaps. This system is not costly, for a bull born in February is able to leap in June or July of the year following; he is sold to the butcher in September or October for as much as a fat heifer would bring. His leaps have consequently cost nothing, and the desired result is assured.

One thing that has greatly contributed to the advancement of agriculture in the district of Herve-Aubel is the good understanding that has always existed between the landowner and his tenant; and yet leases are only made every three years. They are for three, six, and nine years, and always begin on the 1st of May. A tenant leaving a farm leaves all the manure that has accumulated during the winter for the use of his successor; he is strictly forbidden to remove any hay, even if he brought some when he came, but he has a right to arrange matters so as to have all the hay consumed by his own cattle, the number of which increases or diminishes in winter, according as feed is more or less abundant.

So far as I am aware not a single landlord has been obliged of late years to levy on a tenant's cattle for non-payment of rent. Rents are paid twice a year with the utmost punctuality.

When a tenant gives up a farm he proceeds, through the agency of a notary, to have his live-stock and farming implements sold at public auction, and such sales are made for cash, 5 per cent. being added to pay the notary's fees and the expenses of the sale. If the seller has the reputation of keeping fine cattle the bidding is enthusiastic in the extreme. There is no need of giving credit to purchasers. So far from this being the case, if the seller should make it known that the sale would be made on credit purchasers from the district would not attend the sale. The reason why they would not is readily seen. These farmers, as a general thing, have sufficient capital to work their farms, and they do not intend that parties who have no money shall compete with them.

This practice differs not a little from that which is in use in the other agricultural cantons of the province, where 15 per cent. is added to the price of horses, cattle, and implements purchased at public sale. However this may be regarded, the increase is at the expense of the seller.

The rent of a farm is sometimes fixed according to the number of cows that may be kept on it, and sometimes at so much per hectare. While some farms are still let for less than 200 francs per hectare, the land which they contain is fourth and fifth rate land.

First and second rate meadow lands are rented at from 250 to 300 francs (from $50 to $60), while the very choicest lands bring 400 francs ($80) per hectare. These are situated near the town of Herve, the burg of Aubel, and the beautiful villages of Battice, Chaineux, Charneux, Clermont, and Thimister. Ten hectares (25 acres) of these very choice meadow lands afford pasture for from twenty to twenty-four animals in summer and sufficient hay to winter at least twenty.

The farmer who undertakes to work a farm, whether large or small, always has the capital required for the purchase of the necessary stock and agricultural implements. Six thousand francs ($1,200) are required for a farm of 10 hectares (25 acres). As to implements, their cost is insignificant. He will need a dozen pitch-forks and as many rakes, two shovels, two dung-forks, a straw-cutter, one or two wheel-barrows, dairy utensils, and furniture. Farmers who work 12 or 15 hectares (30 or 37 acres) and upward keep a horse, which they use for hauling hay, manure, fuel, and lumber. They hitch him to a wagon so that he may take their produce to market, and sometimes let him work for the neighbors.

Leaving out the wages and the board of a female servant, it is estimated that the expense of cultivation does not exceed 50 francs ($10) per hectare (2½ acres). Of 10 hectares of pasture land three and a half are mowed at a cost of 25 francs per hectare. Mowers from Ardennes and the valley of the Meuse perform this labor. Not a single farmer mows his meadows himself; he contents himself with working at hay-making with his children and with hired hands from the neighborhood, both male and female, who are well paid and well fed.

Every good farmer is exceedingly careful with regard to the manner in which his hay is moved; he requires that the scythe leave nothing after it; the grass must be cut uniformly close to the ground. This requirement is fully justified, for if the grass has attained an average length of from 50 to 60 centimeters (16 to 20 inches), and if the mower leaves 2 centimeters (¾ of an inch), 4 per cent. of the grass is of course lost; moreover, when a meadow is mowed as close as it ought to be the second growth is always more vigorous and uniform.

These 3½ hectares (8¾ acres) of meadow land are manured in the spring with all the manure that has accumulated during the winter; it is spread by the members of the family and the hired men. A regular carter, with his horse and cart will, in three days, do all the carting of manure that is needed. The expense of this is 40 francs, or $8.

The work of repairing fences and keeping them in order is intrusted to none but skilled mechanics—men who thoroughly understand their business and who do this work, when the weather permits, during the dull season.

The traditional way of judging of the excellence of a farm is by the condition in which its fences are kept. This is very natural. As they are to inclose numerous and vigorous herds both day and night, these fences should be of the strongest possible kind.

All the new hedges that have been planted along the main roads and improved cross-roads are of live thorn bushes, cut and kept at the uniform height of 1 meter and 40 centimeters (4 feet 3 inches). Hedges planted in the meadows are perennial, and consist of yoke elms, hazels, hollies, and thorn bushes.

At the foot of these beautiful hedges the grass grows as it does in the middle of a meadow. A farmer would be disgraced if he allowed brambles, nettles, or other injurious parasitical plants to grow at the foot of these hedges; hardly is the violet suffered to grow there.

The value of land in the province of Liege was, in 1846, 2,797 francs ($560) per hectare; in 1856 it was 3,596 francs ($720); in 1866, 4,239 francs ($848).

The statistics of 1846, 1856, and 1866 show this value according to agricultural districts. We consequently know that the average value of a hectare in the canton of Herve was, in 1846, 3,087 francs ($617); in 1856, 4,000 francs ($800); and in 1866, 4,825 francs ($965).

The average annual rent paid for land in the province was, in 1846, 81 francs ($16); in 1856, 101 francs ($20); in 1866, 124 francs ($25); at Herve it was, in 1846, 118 francs ($23); in 1856, 150 francs ($30), and in 1836, 165 francs* ($33). These figures are official. Prices are now much larger.

In almost all the agricultural cantons of the province of Liege farms are divided up so that they may be more advantageously sold. In the district of Herve-Aubel this method of selling is unknown. At the present time the price of a hectare of fourth and fifth rate meadow land in the district of Herve-Aubel is upward of 5,000 francs ($1,000) and that of a hectare of second and third rate meadow land is upward of 7,000 francs ($1,400). Three farms were very recently sold—one of them, situated at Bouxhmont-Charneux, containing 9 hectares; two of them, situated in the Commune of Battice, one containing 10 hectares, situated at Chene-du-Loup; the other, containing 12 hectares, at Grand-Xhore, at 10,000 francs per hectare. Six hectares of meadow land, without buildings, situated near the village of Clermont, were sold for 61,000 francs; these 6 hectares were purchased by two farmers. Two of the farms sold were leased at the rate of 400 francs ($80) per hectare; the average price at which meadow land is now sold in the district of Herve-Aubel is nearly 8,000 francs ($1,600) per hectare.

The dwelling houses and stables are strongly built of stone or brick; the greater part of them are roofed with slate, the rest with tiles; thatched roofs are a thing of the past. The stables adjoin the dwelling houses, and in the wall that separates them are doors through which the stables may be entered; they are thus more easily cared for in winter. The stables are lined and vaulted; a passage separates them; the troughs extend to this passage, in which the food is prepared and distributed to the animals.

*In France the average price of arable land per hectare was, in 1862, 2,198 francs ($440); of meadow land, 3,377 francs ($676); of vine land, 2,727 francs ($546). The rent paid for a hectare of land was, on an average, 70 francs ($14); for meadow land, 109 francs ($22); and for vine land, 102 francs ($20.50).

An architect in Verviers recently prepared an excellent plan of a stable for 24 head of cattle; it is 22 meters long by 6 wide (66 by 10 feet). Iron rafters support the vault; four rows of cows are accommodated in it with ease, and there are two passages, one for two rows. The animals that form the two middle rows are placed back to back. A stable of this kind costs but little, and unites in itself every hygienic advantage.

Care is taken to build the bake-house of each farm at a sufficient distance from the other buildings to avoid fires. The hog-sty is generally built close to the bake-house.

No litter is made; the cows lie on the hard floor, which is kept in a state of constant cleanliness. The droppings of the animals are taken and piled up in a manure ditch, which adjoins the buildings. The ordinary causes of waste of fertilizing matter are not to be feared here, as the manure is firmly piled.

The part of the farm where the cattle are kept usually consists of land somewhat higher than the orchard; the rain water that falls from the roof on the manure heap, some elements of which it absorbs, is led through small trenches to the orchard, which is irrigated by it, so that nothing is lost.

At a short distance from the buildings there is a pond of water which is collected from the roofs or from the little springs, with which the district is abundantly supplied. There is not a meadow without its pond, this being one of the first requirements on a farm consisting entirely of permanent meadows.

There are, we think, 1,000 farms in the district of Herve-Aubel. The orchards which surround the buildings are planted with walnut, apple, and pear trees, but very seldom with stone-fruit trees; according to statistics, there are 1,600 hectares (4,000 acres) of orchard or of wooded meadow land. These figures must be accepted as correct, for there is, at most, for each farm one hectare and a half planted with fruit trees at the rate of 80 trees to the hectare. The district of Herve-Aubel, therefore, has 128,000 fruit trees in full bearing; yet, although they are cared for and trimmed with the utmost diligence, and although the cattle deposit an abundant supply of manure about them, there is an abundance of fruit not oftener than once in three years. The value of the average yield of each tree, in years when the crop is abundant, is estimated at 10 francs, which makes an income for the district of 640,000 francs ($108,000) every three years.

Although these figures appear high, the number of orchards is not increased, because the experience of more than a hundred years shows that the milk of cows pastured in meadows without trees is richer than that of those which graze in orchards. The latter, being shaded, do not receive the sun's rays. Another reason is that, if meadows intended to be mown were planted with trees, the grass, being deprived of the heat of the sun, would need several days more than it does now for drying.

Many farmers sell their fruit to dealers, who resell the good qualities in the towns. Others convert them into sirup and vinegar, of which they lay in a stock in years when the yield is abundant.

Drunkenness is unknown among the great majority of the farmers in this district; consequently a state of comparative affluence prevails, which is the result of industry, order, and economy; morality and uprightness are the main characteristics of the inhabitants.

Refinement, moreover, is not lacking; one needs only to be present at the conclusion of high mass on Sundays and feast days in order to see and admire the elegance of the young people of both sexes.

This district is abundantly supplied with means of communication; in addition to the main roads which intersect it, first class minor roads have been built between the various villages and hamlets.

The subject has been somewhat agitated of late years of a railway from Battice to Bleyberg, via Aubel; there is no doubt that this plan will be carried out, either by the state itself or by a company to which a very low rate of interest on the amount is guaranteed by the state. What is called the network of railways of the plateaus of Herve would not be completed if Aubel were allowed to remain isolated; it is, therefore, a matter of strict necessity that the burgh of Aubel and the neighboring localities should be connected with Verviers, their shiretown; this district, moreover, offers great advantages to a railway, since it does not produce any grain, and all its cereals are brought from other places. No potatoes even are raised here; all that are used are brought from Ardennes and from Holland.

FRANCOIS FLECTRET.

ST. JEAN SART-AUBEL, *October* 17, 1883.

LIVE STOCK IN BAVARIA.

REPORT BY CONSUL HARPER, OF MUNICH.

The counting of live-stock in Bavaria was taken in January, 1883, and in connection therewith the average market value and average weight of the various animals. From this accounting we gather the following:

The total capital so invested was $189,706,761.69, divided as follows:

Description.	No. of head.	Total value.	Value per head.
Horses:			
Foals under 1 year of age	19,973	$744,611 08	$37 27
Horses 1 year and under 2 years of age	21,442	1,338,609 34	62 43
Horses 2 years and under 3 years of age	17,748	1,553,127 70	206 51
Stallions 3 years old and over	4,007	1,026,508 04	256 18
Other horses 3 years old and over	293,141	33,586,634 49	114 62
Total	356,316	38,249,490 75	107 34
Mules	83	5,236 00	63 07
Asses	152	3,643 78	23 97
Neat-cattle:			
Calves under 6 weeks old	90,482	778,710 53	8 59
Calves from 6 weeks to 6 months old	218,686	3,466,255 56	15 85
Cattle 6 months to 2 years old	688,318	22,017,083 45	31 99
Bulls 2 years old	82,395	1,845,067 15	56 95
Bulls and oxen 2 years old and over	422,761	27,671,335 37	65 45
Cows 2 years old and over	1,584,456	77,917,916 79	49 17
Total	3,037,098	133,696,368 85	44 03
Sheep:			
Wool sheep under 1 year old	38,274	145,444 89	3 00
Wool sheep over 1 year old	69,749	364,375 38	5 00
Meat sheep under 1 year old	41,977	102,485 22	3 00
Meat sheep over 1 year old	108,096	611,175 91	5 00
Other sheep under 1 year old	221,196	690 916 62	3 00
Other sheep over 1 year old	698,978	3,051,404 66	4 00
Total	1,178,270	5,025,802 68	4 00
Swine:			
Under 1 year old	759,923	6,834,990 15	9 00
Swine kept for breeding over 1 year old	131,842	2,445,410 02	18 00
Other swine over 1 year old	146,579	2,697,034 80	18 00
Total	1,038,344	11,977,434 97	11 00
Goats	220,818	743,764 66	3 00

The living weight of cattle and swine was as follows:

Description.	No. of head.	Total weight.	Weight per head.
Cattle:		*Pounds.*	*Pounds.*
Calves under 6 weeks old	90,482	8,986,019	93
Calves 6 weeks to 6 months old	218,686	38,749,955	117
Young cattle 6 month to 2 years old	688,318	264,521,569	384
Bulls and oxen 2 years and over	455,156	388,676,576	853
Cows 2 years old and over	1,584,456	1,097,092,807	692
Total	3,037,098	1,798,026,926	

JOSEPH W. HARPER, *Consul.*

UNITED STATES CONSULATE,
Munich, November 6, 1883.

BRITISH CATTLE STATISTICS.

INCLOSURES IN CONSUL-GENERAL MERRITT'S REPORT.

The following is a copy of a printed circular sent from the consulate-general at London to leading cattle breeders and raisers in England. The answers to this circular constitute the "inclosures" referred to in the consul-general's report; and such portions of these inclosures as are not incorporated in said report, and are otherwise considered of practical value to American agriculturists, are herewith published:

DECEMBER 24, 1883.

SIR: The favor of information on the following subject would much oblige, to enable the Department of State, Washington, to locate such foreign domesticated animals as have been for a long time profitably bred and reared in their native homes, under similar conditions in the United States. Please forward the same in the inclosed addressed envelope to

H. KAINS JACKSON.

DISTRICT:—

ALTITUDE. MEAN TEMP. TEMP. IN SUMMER. WINTER.

Soil —Alluvial
Loam
Clay
Sandy, &c., &c.
Subsoil Geological strata

PASTURAGE, NATURAL OR ARTIFICIAL GRASSES:—

How stock is housed?
Methods of feeding?
Do. breeding?
Do. marketing?

NAME OF BREED:—

Size at maturity. Cow. Bull. Ox.
Live weight.
Annual average yield of milk in pounds or quarts. { Pounds of butter. / Pounds of cheese.

ORIGIN OF BREED:—

Description, and how long pure bred?
Color.
Maturity. Weight. Age.
Product in labour.
Meat. Milk. Cheese.

GENERAL REMARKS.—The above questions are furnished rather as hints than for categorical answers; and you are asked here to offer any information and suggestions, and in any form you may wish to write them, in respect to horses, sheep, or pigs, as well as cattle. The object of this circular is that the American agriculturists and stock-breeders may learn the best varieties of stock to purchase from abroad as adapted to their own special localities.

THE SANDRINGHAM HERD.

[Inclosure No. 1 in Consul-General Merritt's report.]

Stock is housed at night; cows and heifers always run out. The feeding is chiefly hay, mixture of best linseed, and cotton—from 3 to 7 pounds. Heifers come in with first calves about thirty-two months old.

As a breeding herd the milk is entirely devoted to calf-raising.

The present herd were started by the Prince of Wales in 1877.

The Prince of Wales has a herd of Bates & Knightley Short-horns and one of Booth, and in both cases the cattle are treated as a tenant farmer would do, the object being

to make the animals as hardy as possibly can be managed. The land, as stated above, is various and the district cold.

The Prince keeps also a small herd of Alderneys and a stock of Southdown ewes, also a few black Polled Scotch cows for breeding cross breds.

Short-horns and sheep are exhibited at the various agricultural societies, and His Royal Highness took the prize last year at the Royal Agricultural Society, held in York, for the best Short-horn family of five. The Prince took first for aged rams at York and champion at the Royal Counties.

All stock can be inspected by making an appointment in writing and giving two clear days' notice.

EDMUND BECK,
Agent, Sandringham, Norfolk.

The nearest station is Wolferton, and the Booth herd is within one minute of the station.

CATTLE IN THE WEALD OF KENT.

[Inclosure No. 8 in Consul-General Merritt's report.]

The Sussex breed of cattle has the appearance of being nearly identical with the Devon, and has been the prevailing stock throughout Sussex and a large portion of the Weald of Kent for a very long period. It is a hardy, kindly animal, yielding a high quality of beef and fats readily. Until lately they were much valued for working purposes, but as milkers they are of but little use, the calf taking nearly the whole of the cow's milk to rear it. They are yarded in winter on account of the wetness of the soil and not on account of any delicacy of constitution.

W. MORLAND,
Lamberhurst Court Lodge, Kent.

CATTLE AND SHEEP IN BUCKS.

[Inclosure No. 9 in Consul-General Merritt's report.]

My farm is on a hill, sloping into the valleys all around it. The soil varies from strong clay at the bottom to deep loam on the sides, and stone brash on the top of the hill. It is a mixed farm of about 270 acres arable, and 330 pasture. I keep a breeding herd of about 70 milch cows—Short-horn grades; sell milk, and wean my heifer calves; cows average when in milk about 16 pints of milk each per day. I keep a flock of Oxfordshire down sheep. I lamb twelve score ewes, breed rams, and sell about 100 shearling rams annually; have an auction sale the first Wednesday in August or last Wednesday in July, when I sell about 60 of the best. Last year they averaged £23 9*s.* 6*d.* each, in 1882, £26 13*s.* 8*d.* each. Many are sold to go to Germany to cross the Merinos, some go to America, the rest to the leading stock-masters in England. I have bred this breed for nealy thirty years, keep up the pedigrees, and show at the "Royal" and some few other leading shows, with what success the "journals" of the Royal Agricultural Society of England will tell.

P. S.—I might say the Oxfordshire down sheep seem adapted for all climates, all soils, and all systems of management, and improve any breed of sheep they are crossed upon, especially Merinos.

JOHN TREADWELL,
Upper Winchenden, Eylesbury, Bucks.

PRIZE BREEDERS OF BRITISH CATTLE.

[Inclosure No. 11 in Consular-General Merritt's report.]

A statement of the breeds and ages of the animals which have won the gold medals, silver cups, and champion plate, offered by the club for cattle, to the year 1881 *inclusive, together with the names of the exhibitors and breeders.*

NOTE.—The portion of the following up to the year 1857 inclusive is extracted from the "History of the Smithfield Club," by Sir B. T. Brandreth Gibbs, honorable secretary.

EXTRA PRIZE £10 FOR BEST STEER OR OX IN THE FIRST SIX CLASSES.

Year.	To exhibitor.	Breeder.	Breed.	Age.
				y. m. d.
1807	William Flowers	James Walwyn	Hereford ox, no age named	0 0 0
1808	Samuel Chandler	William Walker	Hereford ox	6 0 0
1809 to 1829	Discontinued.			

GOLD MEDALS FOR BEST IN ANY OF THE CLASSES.

1830*	Self	Marquis of Exeter	Durham steer	3 10 0
1831	Self	Earl of Brownlow	Durham ox	4 7 0
1832	Self	J. B. Topham	do	5 7 0
1833	Henry Townshend	William Townshend	Durham heifer	4 9 0
1834	Self	Earl Spencer	Durham ox	4 6 0
1835	George Peach	John Dent	Durham heifer	4 11 0
1836	John Verney	Marquis of Tavistock	Hereford steer	3 10 0
1837	Self	R. W. Baker	Short-horn heifer	3 5 0
1838	C. Hillyard	Ex. of late Mr. Talbot	North Devon ox	4 8 0
1839	Earl of Warwick	R. Hill	Hereford ox	4 11 14
1840	Self	Earl Spencer	Durham ox	5 0 7
1841	Self	R. Wright	Durham cow	5 2 0
1842†	Mr. Maxwell	Sir Charles Tempest, Bt.	Short-horn cow	6 8 0
1843	Sir Charles Tempest, Bt.	Self	Short-horn heifer	4 9 0
1844‡	Henry Brown	Self	Durham heifer	4 0 0

GOLD MEDALS FOR STEER OR OX (BEST IN THE CLASSES).

1845	R. M. Layton	P. Prosser	Hereford ox	4 8 0
1846	Earl of Warwick	John Thomas	do	5 0 17
1847	W. D. Manning	Self	Short-horn ox	4 4 0
1848	Earl of Leicester	Self	North Devon steer	3 8 0
1849	Richard Jones	James Cartwright	Hereford ox	4 10 0
1850	William Heath	James Bill	Hereford steer	2 10 0
1851	Edward Longmore	Self	do	3 8 0
1852	Richard Stratton	Self	Short-horn ox	4 10 0
1853	do	Self	Shorth-horn steer	3 9 5
1854	Duke of Rutland	Self	Short-horn ox	4 4 0
1855	Marquis of Exeter	Self	Short-horn steer	3 10 0
1856	William Heath	John Passmore	Devon ox	4 5 0
1857	Edward Wortley	Self	Short-horn steer	3 10 6
1858	Richard Stratton	Self	do	2 8 21
1859	Richard Shirley	Self	Hereford steer	2 6 27
1860	R. W. Baker	Self	Short-horn steer	3 8 0
1861§	George Taylor	Christopher Clark	do	2 11 7

* The gold medal in 1830 was offered by Mr. Kiteles.
† After this year (1842) the gold medals were awarded to the exhibitors instead of the breeders.
‡ After this year (1844) two gold medals were given—one for the best steer or ox, and one for the best heifer or cow.
§ After this year (1861) a silver cup value £40 was submitted for the gold medal.

Silver Cups for Steer or Ox.

Year.	To exhibitor.	Breeder.	Breed.	Age. y. m. d.
1862	John Overman	Self	Devon and Short-horn	3 4 0
1863	William Heath	Thomas Lockley Meire	Hereford ox	4 0 0
1864*	John Walesby Kirkham	Luke Harrison	Short-horn steer	2 5 20
1865	Duke of Sutherland	Dr. McGillivray	Scotch-horn ox	5 8 0
1866	Richard Heath Harris	Alexander Cowie	Short-horn and Scotch-polled	4 8 0
1867	William McComble	Self	Scotch-polled	4 8 0
1868	William Heath	Late Thomas Elesmere	Hereford ox	4 8 0
1869	Earl of Aylesford	Self	Short-horn steer	3 2 8
1870	William Taylor	R. Stranger	Devon ox	4 6 0
1871	Joseph Stratton	The late Rich'd Stratton	Short-horn ox	4 3 6
1872	James Bruce	John MacPherson	Polled Aberdeenshire steer	3 8 11
1873	J. S. Bult	Self	Short-horn ox	4 2 0
1874	....do.	Self	Short-horn steer	3 2 3
1875	G. Sowerby	Self	Short-horn ox	4 2 0
1876	Samuel Kidner	Self	Devon ox	4 1 1
1877	H. R. H. the Prince of Wales.	William Shapland	Devon steer	3 2 0
1878	James S. Bult	Self	Short-horn steer	3 11 0
1879	Henry D. Adamson	James Bruce	....do.	2 5 3
1880	J. J. Colman, M. P.	James Durno	Cross steer	3 7 18
1881	Sir W. G. Gordon-Cumming, Bart.	G. Williamson	Scotch-polled steer	2 8 6

Gold Medals for Heifer or Cow (Best in the Classes.)

1845	William Trinder	Lord Sherborne	Durham heifer	3 10 0
1846	John Booth	Self	Durham cow	9 10 0
1847	Earl of Radnor	Self	Hereford and Long-horn cross heifer.	2 8 0
1848	John Mann	Self	Durham cow	9 0 0
1849	Samuel Wiley	Self	Short-horn cow	7 2 0
1850	Stephen Gooch	Nathaniel Cartwright	....do.	5 3 0
1851	Samuel Druce	Self	Short-horn and Hereford cross heifer.	3 4 14
1852	J. D. Cook	Self	Hereford cow	6 11 0
1853	Henry Smith	William Smith	Short-horn cow	5 8 9
1854	Charles Towneley	Alexander Bannerman	....do.	6 8 0
1855	Henry Ambler	W. D. Manning (the late)	....do.	7 11 16
1856	Richard Stratton	Self	....do.	5 8 9
1857	Lieut. Col. Towneley	Self	....do.	4 1 0
1858	J. W. Brown	Self	Short-horn heifer	3 10 21
1859	Lieut. Col. Towneley	Self	....do.	3 7 2
1860	Richard Hill	Self	Hereford cow	5 2 0
1861†	John Faulkner	Sir J. Harper Crewe, Bt.	Short-horn cow	5 10 0

Silver Cups for Heifer or Cow.

1862	Robert Tennant	Self	Short-horn heifer	3 6 10
1863	Charles Swaisland	Lady Lubbock	....do.	2 10 0
1864‡	Richard Taylor	Self	....do.	3 8 21
1865	Earl of Radnor	Self	Short-horn heifer	3 3 0
1866	Richard Stratton	Self	Short-horn cow	4 10 14
1867	Henry Bettridge	E. Tanner	Hereford heifer	3 6 0
1868	Earl of Hardwicke	Self	Short-horn heifer	3 5 21
1869	Sir W. C. Trevelyan, Bt.	Self	Short-horn cow	5 3 21
1870	Trevor L. Senior	Late Charles Gibbs	Devon heifer	2 6 0
1871	James Bruce	Alexander Paterson	Scotch-polled heifer	3 8 14
1872	Trevor L. Senior	Walter Farthing	Devon heifer	3 4 3
1873	John Walter, M. P.	Hy. Micklem	Short-horn heifer	3 2 0
1874	Richard Stratton	Self	....do.	2 9 0
1875	William Fox Beaven	Self	....do.	3 9 0
1876	Joseph Stratton	Self	....do.	3 11 0
1877	N. Catchpole	Self	....do.	3 7 0
1878	Richard Stratton	Self	....do.	3 10 14
1879	....do.	Self	....do.	3 7 19
1880	Charles Thomas Lucas	Self	....do.	3 6 0
1881	Sir W. G. Gordon-Cumming, Bart.	Self	Scotch-polled heifer	2 8 0

*After this year (1864) a gold medal to the breeder was substituted for the silver medal hitherto given.

†After this year (1861) a silver cup value £40 was substituted for the gold medal.

‡After this year (1864) a gold medal to the breeder was substituted for the silver medal hitherto given.

Silver Cups for Shropshire, Oxfordshire, Cross-bred, or any other Breed not Before Specified (Best Pen of Wethers in the Classes).

Year.	To exhibitor.	Breeders.	Breed.	Age.
				m. wk.
1862	Zachariah W. Stilgoe	Self	Sussex and Cotswold	20 8
1863	John Overman	Self	Leicester and South-down	20
1864	....do	Self	....do	20
1865	Duke of Marlborough	Self	Oxfordshire-down	21
1866	John Overman	Self	Leicester and South-down	20
1867	Samuel Druce	Self	Oxfordshire	21 2
1868	Alfred Rogers	Self	....do	21 2
1869	John Overman	Self	Long Wool and South-down	21
1870	....do	Self	....do	21 2
1871	Lord Chesham	Self	Shropshire wethers	21
1872	Duke of Marlborough	Self	Oxfordshire wethers	21
1878	....do	Self	Oxford wethers	21

Champion Plate (Value £105) to Exhibitor of Best Beast in the Show.

1869	Earl of Aylesford	Self	Short-horn steer	3 2 8
1870	Thomas Pulver	Self	Short-horn ox	3 9 0
1871	Joseph Stratton	The late R. D. Stratton	....do	4 3 0
1872	James Bruce	John MacPherson	Polled Aberdeenshire steer	3 8 11
1873	John Walter, M.P.	Hy. Micklem	Short-horn heifer	3 2 0
1874	H. R. H. The Prince of Wales.	Hugh Aylmer	Short-horn cow	4 5 0
1875	Thomas Willis	Self	....do	4 7 0
1876	Samuel Kidner	Self	Devon ox	4 1 1
1877	N. Catchpole	Self	Short-horn heifer	3 7 0
1878	Richard Stratton	Self	....do	3 10 14
1879*	James John Ratcliffe	Self	....do	3 4 0
1880	J. J. Colman, M.P.	James Durno	Cross steer	2 7 16
1881	Sir W. G. Gordon-Cumming, Bart.	Self	Scotch-polled heifer	2 8 0

*After the year 1879 the club's gold medal was given to the breeder.

Cup Prizes for Best of each Breed.

[Breed cups, value £40 each, to the exhibitor of the best beast of each breed.]

Year.	Exhibitor.	Breeder.	Breed.	Age.
				y. m. d.
1874	T. L. Senior	Richard Stranger	Devon	4 0 0
	Richard Hill	Self	Hereford	4 4 0
	James S. Bult	Self	Shorthorn	3 2 3
	John Kent	William Wood	Sussex	3 7 0
	Sir W. Gordon-Cumming	W. Webster	Highland	4 10 20
	Henry Humphrey	Sir C. Goring	Cross	3 11 0
	Benj. Brown	Self	Norfolk polled	5 8 0
1875	T. L. Senior	Richard Stranger	Devon	5 0 0
	William Groves	Messrs. Heighway & Son	Hereford	3 1 0
	Thomas Willis	Self	Short-horn	4 7 0
	William Wood	Self	Sussex	4 9 0
	Duke of Sutherland	Self	Scotch Highland	5 7 0
	Thomas Statter	George Shand	Cross	5 4 0
1876	Samuel Kidner	Self	Devon ox	4 1 1
	Robert Wortley	Thomas Lowe	Hereford ox	4 3 0
	Joseph Stratton	Self	Shorthorn heifer	3 11 0
	William McCombie	James Barron	Sussex / Scotch polled ox	4 6 0
	James Reid	James Merson	Cross steer	3 9 0
1877	H. R. H. The Prince of Wales	William Shapland	Devon steer	3 2 0
	Henry Page	D. Edwards	Hereford ox	4 2 0
	Nathaniel Catchpole	Self	Shorthorn heifer	3 7 0
	Alfred Agate	Self	Sussex steer	3 2 0
	Sir W. Gordon-Cumming	The late Alex. Paterson	Scotch polled heifer	3 10 0
	Lord Lovatt	Wm. Brown of Linkwood & Aberdeen.	Shorthorn steer	3 10 0
1878	John Robert Overman	Mrs. Clark	Devon steer	3 4 -
	Robert Wortley	J. U. Farmer	Hereford ox	4 3 21
	Richard Stratton	Self	Shorthorn heifer	3 10 14
	John Woodruff	John Kirkpatrick	Sussex steer	3 9 0

CUP PRIZES FOR BEST OF EACH BREED—Continued.

Year.	Exhibitor.	Breeders.	Breed.	Age.
				y. m. d.
1878	Sir W. Gordon-Cumming..	George Williamson.....	Scotch polled ox.....	4 7 0
	George Shand.....	Self.....	Cross.....	3 8 0
1879	John Walter, M P.....	Samuel Kidner.....	Devon ox.....	4 0 25
	Mrs. Edwards	Self.....	Hereford cow.....	4 3 20
	Richard Stratton.....	Self.....	Shorthorn heifer	3 7 19
	John Kirkpatrick.....	Self.....	Sussex steer.....	3 7 16
	Sir W. Gordon-Cumming..	C. Grant.....	Scotch polled steer.....	2 8 9
	Lord Lovatt.....	William Kelman.....	Cross steer.....	8 6 7
1880	John Walter, M. P.....	Self	Devon steer.....	2 11 23
	Frederick Platt.....	Self.....	Hereford steer.....	3 4 23
	Charles Thomas Lucas....	Self.....	Short-horn heifer.....	3 6 0
	John Stewart Oxley.....	Self.....	Sussex heifer.....	3 5 19
	J. J. Colman, M. P.....	Peter Beattie.....	Scotch polled steer.....	2 11 16
	J. J. Colman, M. P.....	James Durno.....	Cross steer.....	3 7 16
1881	John Walter, M. P.....	Walter Farthing.....	Devon heifer.....	3 0 29
	Lewis Loyd.....	Self.....	Hereford heifer	3 1 3
	W. S. Gibbs.....	Self.....	Shorthorn cow.....	4 10 7
	Alfred Agate.....	Self.....	Sussex heifer.....	3 5 18
	Sir W. Gordon-Cumming..	Self.....	Scotch polled heifer	2 8 9
	Sir John Swinburne, Bt..	Self.....	Cross-bred steer.....	2 4 0

MILK RECORD OF BRITISH COWS.

(Inclosure 15 in Consul-General Merritt's report.)

Daily yield of milk (in quarts) from sixty cows during twelve months.

No.	Name.	First month.	Second month.	Third month.	Fourth month.	Fifth month.	Sixth month.	Seventh month.	Eighth month.	Ninth month.	Tenth month.	Eleventh month.	Twelfth month.	Daily average over whole period in milk.	During months.
1	Victoria, second prize, Dairy Show, 1878.....	18.5	14.5	11.0	11.0	9.5	8.0	7.5	7.0	6.0	5.5	5.0	2.5	8.83	12
2	Primrose.....	18.5	19.0	17.0	13.0	11.5	11.5	9.5	8.5	8.5	8.5	.....	7.0	11.54	12
3	Jones.....	18.0	20.0	16.0	14.0	11.0	11.0	8.5	4.5	.....	.....	.....	.....	12.87	8
4	Shortlegs.....	16.0	16.0	14.0	14.0	12.5	9.0	9.0	7.5	3.0	2.0	.....	.....	10.3	10
5	Hereford	17.0	17.0	14.0	13.0	11.5	11.0	11.0	9.0	7.0	5.0	2.0	.....	10.68	11
6	Red Cheeks.....	16.5	15.5	14.0	13.0	12.3	11.0	12.0	10.0	8.0	3.5	1.0	.....	10.63	11
7	Paxton	16.5	14.5	12.5	12.0	10.0	9.0	7.0	6.0	6.0	.....	.....	.....	10.38	9
8	Champion.....	19.0	15.5	14.5	12.0	11.0	10.0	11.5	10.5	8.0	8.0	7.5	6.0	9.0	16
9	Barry.....	14.5	16.5	12.5	13.0	12.5	12.0	12.0	9.5	8.5	8.0	7.5	7.0	9.0	17
10	Dasher	18.0	15.0	13.0	11.5	10.5	9.5	9.0	3.5	1.0	.....	.....	.....	10.55	9
11	Cowslip	16.5	14.5	15.0	13.0	12.5	10.0	10.0	9.0	8.5	8.5	7.0	6.0	10.83	12
12	Charmer	21.0	16.5	16.0	15.0	15.0	11.0	10.5	9.0	7.5	7.0	7.5	6.0	10.06	16
13	Jones.....	18.5	16.5	15.0	13.5	12.0	11.0	10.5	9.0	7.0	6.5	6.0	5.5	8.64	17
14	Grenade 5th.....	17.0	14.0	12.0	10.0	9.5	9.5	8.0	6.0	2.0	.....	.....	.....	9.77	9
15	Loosely	19.5	17.5	14.0	11.0	9.0	10.5	8.5	8.0	7.0	4.0	3.0	.....	10.18	11
16	Cockhorn	17.0	19.0	17.0	14.5	13.0	13.0	12.0	11.5	8.0	10.0	0.0	7.0	12.15	13
17	Sandwich.....	18.0	18.0	14.0	12.0	10.5	10.5	9.0	9.5	7.5	6.5	6.5	5.0	10.15	13
18	Meadow Flower 14th (dam of first prize Chippenham).....	19.0	20.0	18.0	13.5	13.5	13.5	11.0	9.0	5.5	3.5	2.0	.....	11.93	11
19	Hereford (Cox's)...	20.0	17.5	17.5	14.5	14.0	12.5	9.5	8.0	3.0	.....	.....	.....	12.24	9
20	Blossom	18.0	22.0	19.0	17.0	16.0	13.0	12.0	9.0	9.5	8.0	7.0	5.5	13.83	12
21	Witney.....	19.0	19.0	17.0	14.0	14.0	12.0	10.0	5.0	0.5	1.5	.....	.....	11.3	10
22	Cherry	20.0	19.5	18.0	16.0	13.0	11.5	14.0	9.0	4.0	4.0	.....	.....	12.3	10
23	Hereford (Corbish's)	20.5	19.0	18.0	18.0	15.5	13.0	11.5	10.5	6.0	.....	.....	.....	14.61	9
24	Tiohorn	16.0	14.0	13.0	12.0	11.5	11.0	9.5	7.5	7.0	7.0	5.5	.....	10.36	11
25	Hereford (old).....	23.0	22.0	22.0	18.0	16.5	16.0	11.0	12.5	12.0	8.0	4.0	.....	15.0	11
26	Noble.....	17.0	16.5	17.5	15.0	11.0	12.5	10.5	8.5	8.5	.....	.....	.....	13.33	9
27	Fair Maid (second prize, Croydon, 1880).....	17.0	16.0	13.0	11.0	9.5	10.0	7.5	8.5	7.5	6.5	4.0	.....	10.04	11
28	Primrose.....	19.5	18.5	17.0	16.5	14.5	12.5	4.5	.....	.....	.....	.....	.....	14.71	7
29	Darling.....	17.0	16.0	15.0	12.5	12.5	13.5	12.5	10.5	8.5	11.5	9.0	6.0	14.04	12
30	Lily.....	17.6	16.0	15.0	12.0	10.5	10.0	10.5	12.5	10.0	11.0	9.5	9.5	10.50	15
31	Champion.....	20.0	19.0	17.0	15.5	14.5	14.0	12.5	13.5	9.5	8.5	.....	.....	14.4	10
32	Droophorn.....	17.5	16.5	15.0	15.0	13.5	13.5	10.0	.....	.....	.....	.....	.....	13.0	7

Milk record—Continued.

No.	Name.	First month.	Second month.	Third month.	Fourth month.	Fifth month.	Sixth month.	Seventh month.	Eighth month.	Ninth month.	Tenth month.	Eleventh month.	Twelfth month.	Daily average over whole period in milk.	During months.
33	Lady	17.0	15.5	13.0	10.5	10.5	10.5	8.5	7.0	.....	.....	.....	.....	11.56	8
34	Bride	18.0	19.0	18.0	12.0	13.5	13.5	12.5	10.5	10.0	9.5	7.5	.....	13.09	11
35	Peasant	18.0	16.0	16.5	15.5	15.0	14.5	12.5	14.5	11.5	10.5	9.0	5.0	13.20	12
36	Pearl 10th	16.5	13.5	12.5	12.0	11.5	8.5	7.5	7.5	6.5	6.5	.....	.....	10.25	10
37	Henrietta 17th	16.0	13.0	12.0	12.0	10.0	8.5	8.5	5.5	4.5	.....	.....	.....	10.0	9
38	Cornish	20.0	20.0	17.0	14.5	15.0	11.5	9.5	10.0	.....	.....	.....	.....	14.68	8
39	Shortlegs	22.0	21.5	21.5	15.5	8.5	6.5	8.0	7.0	6.0	4.5	.....	.....	12.1	10
40	Minnie	18.0	17.0	15.0	14.0	13.5	13.5	12.0	9.5	9.0	6.5	6.5	8.0	10.09	16
41	Infanta	20.0	21.0	18.0	14.0	13.0	8.5	7.5	7.0	6.0	5.0	.....	.....	12.00	10
42	Bailey	19.0	16.0	19.5	18.0	17.0	15.0	11.0	10.5	8.0	2.5	.....	.....	13.65	10
43	Ariel 3d	15.5	12.5	11.5	10.5	7.5	7.0	7.0	5.5	5.5	5.0	3.5	.....	8.35	11
44	Venus 3d	17.5	16.0	14.0	11.5	10.5	10.5	9.5	9.5	8.5	6.5	4.5	.....	11.04	11
45	Sandy	14.5	15.5	12.5	12.0	11.5	11.0	9.0	8.0	7.5	6.5	2.5	.....	10.04	11
46	Brindle	16.0	13.5	10.5	9.5	9.0	7.5	5.5	4.5	4.0	.....	.....	.....	8.88	9
47	Brownie	16.5	15.5	13.5	13.5	10.5	8.5	7.0	6.0	5.5	4.0	2.5	.....	9.36	11
48	Moreton	17.5	16.0	14.0	11.5	11.0	9.0	7.0	5.0	.....	.....	.....	.....	11.37	8
49	Cherrywhite	18.0	17.5	15.0	14.5	14.0	11.0	10.0	7.0	6.5	5.5	3.5	4.0	10.37	12
50	Ruby	15.5	15.5	13.5	11.0	10.5	9.5	5.5	.....	.....	.....	.....	.....	11.57	7
51	Venus 2d	19.0	17.0	15.0	15.0	14.0	12.5	10.5	9.5	5.5	2.5	.....	.....	10.00	10
52	Minikin	19.0	15.5	12.0	12.0	12.0	12.0	10.0	5.5	1.0	.....	.....	.....	11.0	9
53	Betts	16.0	15.5	13.5	13.0	12.0	11.0	9.5	8.0	7.0	6.5	.....	.....	11.2	10
54	Star	16.0	14.5	12.0	13.0	12.0	9.5	6.5	3.0	.....	.....	.....	.....	10.81	8
55	Dumpling	19.0	18.0	15.0	14.0	14.5	13.0	10.0	7.5	6.5	3.0	.....	.....	12.55	10
56	Infant	22.5	17.5	17.5	15.5	13.5	12.5	11.0	11.0	11.0	7.5	7.0	.....	13.81	11
57	Charmer (dam of first prize, Islington, 1879)	20.0	25.0	25.0	23.5	20.5	20.5	14.0	12.0	12.0	11.0	12.5	8.0	17.0	12
58	Stoppe	17.0	16.5	14.0	12.0	10.5	9.5	5.5	3.5	.....	.....	.....	.....	11.06	8
59	Stag	21.0	22.0	22.0	22.0	20.0	17.5	15.5	12.5	10.0	8.5	7.0	7.5	14.14	14
60	Nancy	19.0	18.5	15.0	15.0	15.5	12.0	11.0	9.0	8.0	6.5	8.5	5.5	10.92	14
	Average of sixty cows	18.0	17.09	15.03	13.75	12.55	11.34	9.72	7.94	6.01	4.67	3.05	1.85	11.5	10.83

THE POSITION OF ENGLISH DAIRY FARMING IN 1883.

[Inclosure 16 in Consul-General Merritt's report.]

The marvelous changes and improvements which have arisen during the last decade in the manufacture and disposal of the products of the dairy can scarcely be realized, even by the active participators in the movement, casting a retrospective glance at the general depression of the dairy interests throughout the country so recently as 1869, when the factory system of cheese-making was first introduced into England. Prior to this except in a few favored localities contiguous to populous centers where new milk could be delivered twice a day to the hucksters who retailed it over the counter, there being then no organized system of delivery, those living outside the area of this charmed circle were compelled to convert the chief of their milk into cheese. It is true they reared a few calves, made a little butter from the whey fleetings, and a light skimming from one meal, in order, as was alleged, to prevent the cheese from falling to pieces. In most cases the cheese had to be made in the kitchen, which was often inconvenient and ill-adapted for the purpose. The accommodation for storing and ripening the cheese was generally of a defective character, hence the produce was variable in quality and meager in quantity.

The Derbyshire landlords and others who contributed the funds and devoted much time and energy in experimental dairying, the pioneers who contributed the funds and undertook the labor, have received scant recognition of their philanthropic efforts at the hands of the public. The system was ignored by some and ridiculed by others; yet it accomplished all its most sanguine advocates ever anticipated, which was to raise the inferior qualities to the level of first-class brands. Taking the average price of cheese made in a 300-cow dairy, and comparing them with an equal quantity made indiscriminately in farmhouse dairies, the uniform quantity of the large make gives them a great advantage in the market. Although the system has not expanded so rapidly as was imagined, it is not due to any inherent imperfection, but to a combination of circum-

stances having directed the raw material into new channels. Previous to the factory movement, all statistics as to the yield of milk and its product was meager and unreliable. The more business-like method of dealing with milk by weight, and the weighing of the cheese from the press, showed at a glance the quantity of green cheese produced by a gallon of milk throughout the year. Having ascertained this, the shrinkage or loss of weight in ripening was easily calculated; the cost of labor, salt, and other materials used in the manufacture was correctly ascertained, and the value of the waste products correctly appraised.

Another important lesson to the dairy farmer was the transit of milk for long distances. The Derbyshire milk trade to London, and other large towns, dates contemporaneously with the introduction of the factory. In 1869 there was no milk sent from Derby to London. Now, in the height of the season, the quantity sent by the Midland Railway alone we estimate at 20,000 gallons a day. During the earlier development of the milk trade many losses occurred to the farmers, generally through an imperfect knowledge of the position of the middle men, many of whom were needy adventurers, who, by fair promises and the offer of an extra half-penny per gallon, imposed on the good-natured credulity of the farmers, who allowed their accounts to run on and were frequently mulcted in large sums. The old adage "once bit, twice shy," has led to more careful inquiries as to the respectability and solvency of the purchaser. Weekly, fortnightly, and, at the utmost, monthly payments are now the rule. Yearly contracts are common with a varying scale of prices and quantities for the different seasons. Although the prices of milk have not generally improved, the trade on the whole has assumed a more settled form.

IMPROVEMENT IN THE BREED OF DAIRY CATTLE.

The various grades of Shorthorn comprise four-fifths of the cattle kept exclusively for dairy purposes in the Midland and West Midland counties, and as milk and meat producers they cannot be surpassed. Their size, quality, and aptitude to lay on flesh quickly has been immensely improved by the use of pure-bred bulls. Where these have been selected with judgment, the milking capabilities have likewise increased. A much greater degree of care and attention is exercised in the selection of cows suitable for the dairy. A well-shaped milk vessel is a point on which dairy farmers are becoming more critical. Inferior milkers are weeded out, and either passed on to the grazier or fattened off on the farm. The chief obstacle to more rapid improvement of the ordinary stock of the diary districts is due to a parsimonious and grudging spirit in securing the services of a better class of bulls. A man with a dairy of 30 to 50 cows will give £30 for a young Shorthorn bull, which, after three years' service and three months' stall-feeding, will readily make £35 to £40 to the butcher. The stock left by him will be a remarkable improvement on the original. Instead of exercising more care in the selection of another pure-bred animal to follow, he saves a calf from some favorite cow in his own herd, which, being only a half-bred, reduces the progeny to their original state.

The milk-selling mania, which set in about 1873–'74 and culminated in 1880–'81, completely demoralized the dairy interests of the Midlands. The best men were realizing an average return of £22 to £26 per cow by the sale of milk. On all the best milk farms rearing was for the time completely ignored; the capabilities of farms were taxed to the uttermost in order to produce the greatest possible quantity of milk, the farmers preferring to purchase springing cows to fill up their stalls as required. In the course of three years the system began to tell in the scarcity and enhanced prices of calving cows. The diminution, so to speak, of the cattle population of this country is largely due to the same cause. For the last two years the enhanced prices and inferior quality of the stock has reduced the profits of dairy farming to a small margin. Stock reared on the farm are more healthy and thrive better than strangers, and these are frequently of a nondescript character. Instances are numerous of cows purchased at £24 to £26, after being milked 10 or 11 months, selling as barreners at £16 or £18 each. This makes a rather heavy inroad on the gross returns. The very few men who have quietly gone on rearing sufficient to keep up their herd and finished off their cast cows have suffered little from the pressure of the time. This year the rage for rearing has again set in; colory calves of a few days old have been eagerly picked up at 40*s.* to 50*s.* each. We have a commission to purchase all the bull calves from a herd of 40 ordinary dairy cows at 60*s.* each, delivered on rail at three days old. I need scarcely say they were all by a pedigree bull. Such prices should be sufficient inducement to use a better class of sires.

IMPROVED METHODS OF FEEDING.

The great impetus given to dairy farming by the introduction of the factory system, and subsequently the sale of milk, has led to a much more liberal system of feeding. Formerly the produce of the farm, grass in summer and hay in winter, constituted the

diet of a dairy cow. Cheese was made during eight or nine months. The cow was put dry and rested for at least three months out of the twelve. With milk-selling the case is entirely changed. The supply must be kept up to a fixed standard throughout the year; hence shelter and artificial food are essential. The cows are now regularly milked to within one month of calving. Little long hay is now used, the food is all given in a prepared state. Large quantities of meal, cake, and brewers' grains are used. During the early days of milk-selling some landlords were alarmed lest the land should become robbed and deteriorated. This contingency has not been realized; on the contrary, large sums are now spent on purchased foods, where, under the old cheese-making *régime*, not a shilling was spent on extraneous substances.

I may be allowed to quote an instance, within my own knowledge, of an estate of less than 3,000 acres, purely dairy land, where not a ton of cake or other purchased food was ever used. The average outlay on this estate during the last seven years has been upwards of £2,000. Some of the best men are adopting a modification of the town system. The weak milkers and the more aged are highly fed, and are thus milked and fattened at the same time, and are passed off to the butcher before they are dry. On some of the larger farms a recent improvement is becoming popular. I have fitted up cooking cisterns on several farms. These are constructed of common bricks set in cement, into which is placed a perforated wooden bottom; a pipe from the steam engine delivers the steam into the open space under the false bottom; above, the tank is filled with hay or straw, chaff, or a mixture of the two, with a quantity of unground corn. The cistern is covered by a closely-fitting lid, the steam is turned on, and the contents thoroughly cooked. This has proved to be not only the most economical, as in the case of dairy cows; it is the most efficient method of feeding corn.

YIELD AND VALUE OF MILK.

The improvement of the breed and a more liberal system of feeding have increased the average yield of milk 160 gallons per cow during the last twelve years. The average yield of the best South Derbyshire dairies may be taken at 650 gallons. The popular taste is in favor of a rich, mellow, smooth-flavoured cheese, artificially ripened, at from six weeks to three months old. This is somewhat in favor of the producer, the shrinkage in weight being less than would be the case if kept to a greater age. An imperial gallon of milk at a temperature of 60 degrees weighs 10 pounds 4 ounces; under good management, 11 pounds of milk will produce 1 pound of cured cheese. If we estimate the cost of labor and materials, and allow, on the other side, one halfpenny per gallon for the whey, the cheese must sell at 70*s.* per cwt. of 120 pounds to realize 7*d.* per imperial gallon for the crude milk.

Immense improvements have taken place in butter-making since the Bristol meeting of the Royal Agricultural Society in 1879. The Coolley and Swartz systems were there thoroughly tested by English judges, and their merits fully recognized. Both these systems have been completely superseded by the cream separator, which effects a perfect separation in an amazingly rapid manner. The milk is drawn from the cow, passed over a Lawrence refrigerator, and immediately separated at the rate of 60 gallons or more an hour. The perfectly sweet cream is churned immediately, or, as preferred by some, rendered slightly acid, either by natural or artificial means. So rapid is the process that butter from the morning's milk can be placed in the market the same evening. The cream, when removed by the separator, is as free from milk as can possibly be the case by the ordinary method of skimming; hence the butter is finer, being perfectly free from casein. The quality of cream is further shown by the yield of butter. One hundred quarts of cream frequently produce 11⅔ pounds of butter; the average yield of butter throughout the year, in an ordinary farm dairy, is 16 ounces of butter from 11 quarts of new milk. One of the chief advantages of the separator is the enhanced value of the skim milk, which is perfectly sweet, and will keep so for a much longer period than milk which had been set from twenty-four to thirty-six hours, hence it is more valuable either for household purposes or the rearing of stock; its commercial value is 3*d.* or 4*d.* per imperial gallon. The butter fat only being removed, the solids remain intact to build up the bone and muscle of the young animal, and the sugar as a heat producer; hence its value for stock-raising. The market price of crude milk varies like other commodities. The best prices are generally obtained from local vendors.

There is still a large field open amongst the mining population of the North Midlands, as well as that of the country villages, who can obtain it only as a luxury. Though sent daily from their own doors in large quantities to London and other large towns, the denizens of the country villages are unable to supply their wants. The prices vary from 7½*d.* to 8*d.* for the six summer months and 9½*d.* to 10*d.* for the six winter months, per imperial gallon, out of which the farmer has to defray the cost of carriage, which, if sent to London, is 1*d.* per gallon. Although stringent laws have been placed in the stat-

ute book as to the legality of certain well-defined weights and measures, nevertheless the old barn gallon of 17 pints is used as a measure of capacity to the mystification and, not unfrequently, the loss of the average countryman. Since the use of cream separators has become more general, the use of new milk amongst the working classes has been gradually falling off. The retail price in London of perfectly sweet and wholesome skim milk is 2½*d.* per quart. This cannot fail to prove an inestimable boon to the poorer classes.

THE ADVANTAGES OF THE CO-OPERATIVE FACTORY SYSTEM.

The isolated position and the general circumstances and surroundings of the ordinary dairy farmer seldom lead him into the keen commercial current of modern life, hence he comes more frequently into contact with the middle-man than he does with the consumer. The co-operative principle is specially applicable to modern dairy management, and on all estates of any magnitude factories should be erected and fitted up with the necessary plant for cheese and butter making and milk selling, the tenants paying a moderate rent for the buildings and use of the plant.

On a large scale, it is necessary to have a skillful manager who would act under a general committee of the milk contributors. The association would be hampered by no contracts, and be able at all times to dispose of their produce in the best market. The sale of new milk, cheese-making, or butter-making, and the sale of skim milk, would each be resorted to in order to meet the turn of the markets, so that larger profits might be earned. A constant supervision would insure a more uniform and higher quality than is possible where an equal quantity is made up in separate dairies, with all the disadvantages of inferior plant. Butter factories are on the increase, and the quality of the produce is uniform and vastly superior to the general run of private dairies. To my mind, the chief objection is, they are not conducted on co-operative principles. The milk is purchased at a fixed price, and the farmer has no further interest in the concern.

My employer, the Earl of Harrington, is willing to erect and equip a cheese and butter dairy in the center of a large dairy parish by way of experiment, charging only a nominal rent for the first year or two. There is, however, great diffidence on the part of the tenants to embark in the venture. In order to take full advantage of every fluctuation of the market, one or two condensing pans should be erected in every factory. This insures a complete control over the skim milk, which can either be condensed as plain milk, when it will keep perfectly sweet for six or eight days, and sent to the distant towns and returned to its original state of skim milk by the addition of 85 per cent. of water. This is a palatable and wholesome addition of the food supply of the working classes. The retail price in London is 2½*d.* per quart. The skim milk is likewise sweetened by the addition of sugar, condensed and packed in hermetically sealed tins. This will keep for an almost indefinite period. When wanted for use, the tin is opened, and 85 to 87 per cent. of pure water added. The mixture, when well agitated, has the appearance and taste of sweet skim milk. To my mind, the great practical advantages of the cream separator and condensing pan is that the condensed milk, either plain or sweet, is in a portable form, easily conveyed long distances at a cheap rate, and will prove an inestimable boon to the farmer by enabling him to rear his stock at a cheap rate, so that rearing may be successfully practiced on farms which, under ordinary circumstances, would be impracticable. A condensing factory has been started in South Derbyshire. At present the produce is principally sent to the London markets, and as its properties become better known the demand will largely increase.

The yield of butter varies considerably, even from day to day, irrespective of food. The quality and temperature of the drinking water has a marked effect on the health and secretions of the cow. The simple cream-test tubes now in every-day use long puzzled observant managers as to the direct cause of the varying quantities of cream. Close observations and experience have strengthened the conviction that temperature is the great disturbing cause. The same quantity of milk which under a mean atmospheric temperature of 60 degrees will produce 4 pounds 5 ounces of butter, at a temperature of 70 the quantity of butter is reduced to 4 pounds 13 ounces, and at 80 degrees of temperature there is a further falling off in the quantity to 4 pounds 3 ounces; at 50 degrees the butter is increased to 5 pounds 14 ounces. With regard to added water the analysts are frequently at fault. As soon as the milk is drawn from the cow, chemical changes begin to take place, by which new combinations are formed. The solids in their original state vary slightly; the chemical forces, which are constantly at work, are continually building up new structures from the ruins of the old. By this we imply that even where the cows are fairly well kept the milk at certain times may fall far short of the cream standard without a particle of water being added. All milk now sent by rail is passed over a refrigerator and the temperature reduced from 95 degrees (the normal heat when drawn from the cow) to 60 degrees, at which it is usually sent off. This change of temperature

reduces the volume nearly 5 per cent. Although great improvements have been made during the last 10 years in the handling of milk and its products, there is still much to learn before we can pretend to be adepts in the art.

GILBERT MURRAY.

OCTOBER 1, 1883.

THE MILKING TRIALS AT THE DAIRY SHOW.

[Inclosure 16a in Consul-General Merritt's report.]

The following full report of the yields and analyses of milk at the London Dairy Show have been sent to us for publication:

COWS.

Date of calf or kid.	No.	Age.	Day's milk, quantity.	Quality of total solids.	Fat.	Total award.
		Years.	*lbs. oz.*	*per cent.*		
May 12	*17	7⅔	51 0	12.96	3.85	99.12
September 27	*21	5½	47 0	14.20	4.71	92.05
August 17	25	5½	27 12	13.11	4.01	63.98
August 20	27	5	34 12	13.77	5.30	88.79
September 1	36	7½	32 8	13.21	4.20	73.93
July 28	44	7⅞	28 0	13.29	4.11	67.28
August 5	*49	5 7/12	26 4	14.21	5.14	81.87
June 28	56	4	21 0	14.66	5.06	80.72
April 8	*57	7½	18 8	14.25	5.54	87.50
October 3	65	4½	30 4	14.18	5.12	79.81
August 8	66	4	33 12	13.74	4.92	80.43
July 10	*78	7	60 4	12.12	2.86	91.59
July 4	*81	4½	26 8	14.75	5.23	87.80
September 27	82	5½	51 8	11.48	2.40	68.46

No. 17, Class 1.—Red Cherry (Shorthorn); color, red; age, 7 years 9 months and 1 week; last calf, May 12, 1883; breeder and exhibitor, Mr. J. Phillips (non-pedigree).

Yield of milk, October, 1883: 8.30 a. m., 27 pounds 8 ounces; 7.15 p. m., 23 pounds 8 ounces; total, 51 pounds.

Analysis: Specific gravity, 1.0338; total solids, 12.96; fat, 3.85; solids not fat, 9.11; percentage of cream by volume, 10.

Number of points (1st prize, section No. 1 Champion prize): Quantity, 51; quality, 25.92; time, 13.70; additional fat, 8.50; total, 99.12.

No. 21, Class 2.—Daisy (Shorthorn): color, roan; age, 5 years 6 months; produce, 3 calves; last calf due, per catalogue, September 19; per cowman, September 27, 1883; exhibitor, Mr. Thomas Birdsey (non-pedigree).

Yield of milk, October 3, 1883: 8.30 a. m., 26 pounds 8 ounces; 7.15 p. m., 20 pounds 8 ounces; total, 47 pounds.

Analysis: Specific gravity, 1.0336; total solids, 14.20; fat, 4.71; solids not fat, 9.49; percentage of cream by volume, 11.

Number of points (2d prize, section 1): Quantity, 47.0; quality, 28.4; time, none; additional fat, 17.1; total, 92.5.

No. 25, Class 2.—Honesty (Shorthorn); color, roan; age, 5 years 2 months; produce 3 calves; last calf, per catalogue, August 17, 1883; per cowman, September 27, 1873; exhibitor, Mr. T. Birdsey (non-pedigree).

Yield of milk October 3, 1883: 8.30 a. m., 16 pounds; 7.15 p. m., 11 pounds 12 ounces; total, 27 pounds 12 ounces.

Analysis: Specific gravity, 1.0336; total solids, 13.11; fat, 4.01; solids not fat, 9.10; percentage of cream by volume, 10.5.

Number of points: Quantity, 27.75; quality, 26.22; additional fat, 10.01; total, 63.98.

No. 27, Class 2.—Spot (Shorthorn); color, Sussex brown; age, 5 years; produce, 5 calves; last calf, August 29, 1883; exhibitor, Rev. W. Winlaw (non-pedigree).

Yield of milk October 3, 1881: 8.30 a. m., 19 pounds 8 ounces; 7.15 p. m., 15 pounds 4 ounces; total, 34 pounds 12 ounces.

Analysis: Specific gravity, 1.030; total solids, 13.77; fat, 5.30; solids not fat, 8.47; percentage of cream by volume, 14.

Number of points: Quantity, 34.75; quality, 27.54; time, 3.50; additional fat, 23.00; total, 88.79.

No. 36, Class 3.—Lady Savage (Jersey); color, silver gray; age, 7 years 4 months; last calf about September 1, 1883; exhibitor, Mr. H. C. Smith (non-pedigree).

Yield of milk October 3, 1883: 8.30 a. m., 18 pounds 8 ounces; 7.15 p. m., 14 pounds; total, 32 pounds 8 ounces.

Analysis: Specific gravity, 1.0326; total solids, 13.21; fat, 4.20; solids not fat, 9.01; percentage of cream by volume, 12.

Number of points: Quantity, 32.50; quality, 26.42; time, 3.00; additional fat, 12.00; total, 73.92.

No. 44, Class 3.—Velveteen (Jersey); color, fawn; age, 7 years 2 months 1 week; produce, 6 calves; last calf, July 28, 1883; breeder, Mr. Le Brocq; exhibitor, Mr. J. Cardus (non-pedigree).

Yield of milk October 3, 1883: 8.30 a. m., 13 pounds; 7.15 p. m., 10 pounds; total, 23 pounds.

Analysis: Specific gravity, 1.0336; total solids, 13.29; fat, 4.11; solids not fat, 9.18; percentage of cream by volume, 12.

Number of points: Quantity, 23.00; quality, 26.58; time, 6.60; additional fat, 11.10; total, 67.28.

No. 49, Class 3.—Little Katie (Jersey); color, lemon fawn; age, 5 years 4 weeks; produce, 3 calves; last calf, August 5, 1883; breeder, Mr. C. B. Dixon; exhibitor, Mr. H. H. A. Rigg (non-pedigree).

Yield of milk October 3, 1883: 8.30 a. m., 14 pounds 12 ounces; 7.15 p. m., 11 pounds 8 ounces; total, 36 pounds 4 ounces.

Analysis: Specific gravity, 1.0316; total solids, 14.21; fat, 5.14; solids not fat, 9.07; percentage of cream by volume, 18.5.

Number of points (2d prize, section 2): Quantity, 26.25; quality, 28.42; time, 5.80; additional fat, 21.40; total, 81.87.

No. 56, Class 4.—Countess (Guernsey); color, lemon and white; age, 4 years 2 weeks; produce, 2 calves; last calf, June 28, 1883; breeder and exhibitor, Mr. W. A. Glynn.

Pedigree: Sire, Billy 1st; dam, Duchess.

Yield of milk October 3, 1883: 8.30 a. m., 12 pounds; 7.15 p. m., 9 pounds; total, 21 pounds.

Analysis: Specific gravity, 1.0324; total solids, 14.66; fat, 5.08; solids not fat, 9.58; percentage of cream by volume, 10.

Number of points: Quantity, 21.00; quality, 29.32; time, 9.60; additional fat, 20.80; total, 80.72.

No. 57, Class 4.—Gentle (Guernsey); color, lemon and white; age, 7 years 2 months; produce, 5 calves; last calf, April 8; breeder and exhibitor, Mr. W. A. Glynn.

Pedigree: Sire, Johnny 2d; dam, Fairy 1st.

Yield of milk October 3, 1883: 8.30 a. m., 11 pounds; 7.15 p. m., 7 pounds 8 ounces; total, 18 pounds 8 ounces.

Analysis: Specific gravity, 1.0316; total solids, 14.25; fat, 5.54; solids not fat, 8.71; percentage of cream by volume, 7.5.

Number of points (1st prize, section 2): Quantity, 18.50; quality, 28.50; time, 15.10; additional fat, 25.40; total, 87.50.

No. 65, Class 5.—Lady Flora (Ayrshire); color, brown and white; age, 4 years 6 months; last calf, October, 1882; exhibitor, Mr. G. Ferme (non-pedigree).

Yield of milk, October 3, 1883: 8.30 a. m., 16 pounds 8 ounces; 7.15 p. m., 13 pounds 12 ounces; total, 30 pounds 4 ounces.

Analysis: Specific gravity, 1.0326; total solids, 14.18; fat, 5.12; solids not fat, 9.06; percentage of cream by volume, 12.

Number of points: Quantity, 30.25; quality, 28.36; additional fat, 21.20; total, 79.81.

No. 66, Class 5.—Pride of Leigham Lodge (Ayrshire); color, brown and white; age, 4 years; last calf, by certificate, August 8, 1883; exhibitor, Mr. G. Ferme (non-pedigree); disqualified.

Yield of milk, October 3, 1883: 8.30 a. m., 18 pounds 12 ounces; 7.15 p. m., 15 pounds; total, 33 pounds 12 ounces.

Analysis: Specific gravity, 1.0312; total solids, 13.74; fat, 4.92; solids not fat, 8.82; percentage of cream by volume, 15.

Number of points: Quantity, 33.75; quality, 27.48; additional fat, 19.20; total, 80.43.

No. 78, Class 7.—Magpie (cross, sire Shorthorn, dam Dutch); color, black and white; age, 7 years; last calf, July 10, 1883; exhibitors, Messrs. J. Rumbal and Son (non-pedigree).

Yield of milk, October 3, 1883: 8.30 a. m., 31 pounds 4 ounces; 7.15 p. m., 29 pounds; total, 60 pounds 4 ounces.

Analysis: Specific gravity, 1.0334; total solids, 12.12; fat, 2.86; solids not fat, 9.26; percentage of cream by volume, 9.

Number of points (1st prize, section 3): Quantity, 60.25; quality, 24.24; time, 8.50; less deficiency in fat, 1.40; total, 91.59.

No. 81, Class 9.—Myrtle 7th (Devon); color, red; age, 4 years 5 months 3 weeks; produce, 2 calves; last calf, July 4, 1883; breeder and exhibitor, Mr. A. C. Skinner.

Pedigree: Sire, Duke of Farrington (1323); dam, Myrtle 1st (4765); by Squire Winter (1453).

Yield of milk, October 3, 1883: 8.30 a. m., 15 pounds 8 ounces; 7.15 p. m., 11 pounds; total, 26 pounds 8 ounces.

Analysis: Specific gravity, 1.0336; total solids, 14.75; fat, 5.28; solids not fat, 9.47; percentage of cream by volume, 3.

Number of points (2d prize, section 3): Quantity, 26.50; quality, 29.50; time, 9.00; additional fat, 22.80; total, 87.80.

No. 82, Class 9.—Dairymaid (cross, sire Shorthorn, dam Dutch); color, blue and white; age, 5 years 6 months; produce, 2 calves; last calf, September 27, 1883; exhibitor, Mr. T. Birdsey (non-pedigree).

Yield of milk, October 3, 1883: 8.30 a. m., 27 pounds 8 ounces; 7.15 p. m., 24 pounds; total, 51 pounds 8 ounces.

Analysis: Specific gravity, 1.0336; total solids, 11.48; fat, 2.40; solids not fat, 9.08; percentage of cream by volume, 8.25.

Number of points: Quantity, 51.50; quality, 22.96; total, less 6.00 for deficiency of fat, 68.46.

GOATS.

No. 171, Class 24.—Kitty; breed, horned goat (short-haired), Nubian and British; color, brown and white; age, 7 years; last kid, July 13, 1883; exhibitor, Mr. E. T. Crookenden (non-pedigree); disqualified.

Yield of milk, October 3, 1883: 8.30 a. m., 1 pound 8 ounces; 7.15 p. m., 1 pound 4 ounces; total, 2 pounds 12 ounces.

Analysis: Specific gravity, 1.032; total solids, 14.69; fat, 4.90; solids not fat, 9.79.

No. 289, Class 25.—Nancy (horned goat), long-haired; color, black and white; age, 7 years; produce, 7 kids; last kid, July 3, 1883; exhibitor, Mr. Nixon.

Yield of milk, October 3, 1883: 8.30 a. m., 2 pounds 2 ounces; 7.15 p. m., 2 pounds 4 ounces; total, 4 pounds 6 ounces.

Analysis: Specific gravity, 1.032; total solids, 12.39; fat, 3.34; solids not fat, 9.05.

Number of points (1st prize): Quantity, 4.37; quality, 24.78; total, 29.15.

CENTRAL CHAMBER OF AGRICULTURE.

(Inclosure 16b in Consul-General Merritt's report.)

Chairman: Thomas Duckham, esq., M. P. *Vice-Chairman:* Henry Chaplin, esq., M. P. *Secretary:* Major Craigie.

Chamber.	Secretary.	Vote.
Banbury district	W. T. Warner, 59 Middleton road, Grimsbury, Banbury	1
Bedale	J. Teale, solicitor, Bedale	1
Berks and Oxon Association	J. Neale, 24 Friar street, Reading	1
Brecknockshire	Rhys Davies, 8 Lion street, Brecon	1
Buckinghamshire	George Fell, Aylesbury	4
Cambridgeshire and Isle of Ely	R. Peters, jr., 7 Downing street, Cambridge	2
Cheshire	Thomas Rigby, Sutton Weaver, Preston Brook, Cheshire	2
Cirencester	Robert Ellett, public office, Cirencester	2
Cleveland	T. Petch, Marton, Middlesbro'	1
Clwyd, Vale of	J. D. Lewis, land agency office, Denbigh	1
Cornwall County	G. H. P. Martin, Truro	1
Cowbridge Farmers' Club	G. E. Tutton, Broadway, Cowbridge	1
Croydon Farmers' Club	G. Horsley, 85 Canterbury road, Croyden	1
Devon and Cornwall	J. B. Body, Old Town Chambers, Plymouth	1
South Durham and North Yorkshire	C. Waistell, Northallerton	1
Essex	E. H. Bentall, Elm Villa, Halstead	4
South Essex Farmers' Association	R. T. Wragg, Great St. Helen's	1
Gloucestershire	A. C. Wheeler, Gloucester	3
Hampshire	Robert Raynbird, Basingstoke	2
Herefordshire	J. P. Brown, 21 East street, Hereford	2
Hertfordshire	Vernon Austin, Hertford	2

Central Chamber of Agriculture—Continued.

Chamber.	Secretary.	Vote.
Howdenshire	Henry Green, solicitor, Howden	1
Ixworth Farmers' Club	J. C. Booty, Ixworth, Suffolk	2
Kendal	Arthur Hoggarth, Kendal	1
East Kent	George Slater, land agent, Canterbury	2
Leicestershire	Thomas Wilson, Knaptoft House, Oundle	2
Lincolnshire	Stephen Upton, Saint Benedict's square, Lincoln	3
Maidstone	G. Hurn, Maidstone	1
Monmouthshire	J. S. Stone, 29 Dock street, Newport	2
Newcastle Farmers' Club	T. Bell, Hedley Hall, Marley Hill, Gateshead	1
Newbury	George J. Coeburn, Market place, Newbury	1
Norfolk	J. B. Forrester, Tombland, Norwich	5
Northamptonshire	Thomas J. Adkins, Kurdey road, Northampton	3
Nottinghamshire	Ed. Browne, 1 Cobden Chambers, Belham st., Nottingham	2
Penrith Farmers' Club	Thomas Robinson, Eamont Bridge, Penrith	1
Peterboro' Agricultural Society	J. E. Little, Queen street, Peterboro'	1
Scottish	David Curror, India Buildings, Edinburgh	...
Sevenoaks Farmers' Club	W. H. Cronk, Sevenoaks	1
Shropshire	Alfred Mansell, College Hill, Shrewsbury	4
Somersetshire	Messrs. Mayo and March, Yeovil	2
Staffordshire	W. Tomkinson, Newcastle, Staffordshire	4
Staindrop Farmers' Club	John Abbs, Westholme Winston, Darlington	1
East Suffolk	R. L. Enerett, Rushmere, Ipswich	2
West Suffolk	G. Blencowe, Whiting street, Bury St. Edmunds	3
Sunderland	J. T. Lawson, Hollycar House, Tunstall	1
Swindon	J. A. Davies, 6 High street, Swindon, Wilts	1
Warwickshire	Hugh Suffolk, 8 Priory row, Coventry	3
Wisbeach District	George J. Moore, 1 Bridge street, Wisbeach	1
South Wilts	J. R. White, Zeals St. Martin, Bath	2
Worcestershire	John Blick, solicitor, Droitwich	3
East Riding of Yorkshire	Tom Turner, solicitor, Newbegin, Beverley	1
West Riding of Yorkshire:		
Wakefield Branch	M. B. Hick, Exchange buildings, Wakefield	2
Doncaster Branch	George Chafer, 9 Market place, Doncaster	2
York	H. F. Cundall, 2 Blake street, York	2

DAILY INCREASE IN WEIGHT OF VARIOUS BREEDS.

[Inclosure 17 in Consul-General Merritt's report.]

The following table shows the comparative daily rate of increase in the classes for steers in the Devon, Hereford, Shorthorn, Sussex, Red Polled, Scotch Polled, and Crossed breeds of cattle at Islington.

	Pounds.
Classes for steers not exceeding 2 years old:	
Crosses—7 animals average	2.29
Herefords—6 animals average	2.24
Sussex—7 animals average	2.14
Shorthorns—8 animals average	2.05
Devons—7 animals average	1.70
Classes for steers not exceeding 3 years old:	
Shorthorns—16 animals average	1.93
Crosses—10 animals average	1.90
Herefords—8 animals average	1.88
Sussex—7 animals average	1.84
Scotch Polled—10 animals average	1.81
Red Polled—3 animals average	1.60
Devons—8 animals average	1.52
Classes for steers not exceeding 4 years old:	
Shorthorns—3 animals average	1.61
Herefords—2 animals average	1.60
Sussex—2 animals average	1.60
Crosses—3 animals average	1.60
Scotch Polled—5 animals average	1.55
Red Polled—2 animals average	1.40
Devons—7 animals average	1.35

FRENCH LIVE STOCK.*

[From the London Farmers' Hand-Book. Inclosure O in Consul-General Merritt's report. Expressly translated for the Royal Agricultural Society's Guide, from the official French catalogue of Paris Exhibition.]

The races of domesticated animals met with in France are numerous and widely different, and constitute one of the principal sources of the agricultural wealth of that country. Subject to the various conditions of climate, soil, system of cultivation, &c., they are distributed as follows, according to the last general census of 1873:

Calves	1,252,477
Young bullocks and bulls	947,821
Heifers	1,476,589
Bulls	313,081
Oxen	1,792,570
Cows	5,938,450
Total	11,721,818

The Departments in which the number of stock exceeds 200,000 head are—Finistere, Vendee, Loire-Inferieure, Ille-et-Vilaine, Saone-et-Loire, Cotes-du-Nord, Morbihan, Maine-et-Loire, Mayenne, Nord, Calvados, la Manche, Ain, Puy-de-Dome, Seine-Inferieure, and Cantal.

Those in which the stock is less than 20,000 head are—Vaucluse, Var, Seine, Gard, Herault, Basses-Alpes, Bouches-du-Rhone, Alpes-Maritimes, and the jurisdiction of Belfort.

THE NORMANDY BREEDS.

The Department of Manche, the actual cradle of the Normandy races, constitutes, with that of Calvados, the principal center of production of the stock belonging to the Normandy breeds and their sub-breeds, which latter form a somewhat important item in the supplies furnished for the consumption of Paris.

The Norman breeds are also kept, though in smaller numbers than in Manche and Calvados, in the Department of the Orne, Eure, Seine-Inferiure, Eure-et-Loir, Seine-et-Oise, Seine-et-Marne, and Seine, whence their heifers are sent up, in competition with Flemish cows, to restock the cow-sheds of Paris and its environs.

The famous Isigny butter is made from the milk of cows of the Bessine breed, and from that of other Normandy breeds is made Gournay butter, and the choice Camembert, Livarot, Pont l'Eveque, and Neufchatel cheeses, as well as the Neufchatel double cream cheese, and the Gournay variety known as Gervais cheese.

THE FLEMISH BREED.

The Flemish breed are pre-eminent as milkers. They are met with in the departments of Nord, Pas-de-Calais, Aisne, and up to the suburbs of Paris, but the principal breeding center is in the arrondissements of Dunquerque and Hazebrouck, especially on the extensive pasture of Bergues, Cassel, and Bailleul, where a judicious selection maintains the breed in all the plenitude of its best characteristics.

The Flemish cow is distinguished by a reddish-brown coat, deepening in color towards the head, with a few white marks. The extremities and the natural openings are black. It is of large size and handsome conformation, with a fine skin, a good head, a very straight dorsal line, a large rump, and a fine, well-hung tail. At the same time the chest is wanting in width, and the sides might well be more rounded.

A good Flemish Bergues cow will produce as much as 2,600 liters of milk a year. The daily yield, after calving, often rises in fact to 25 liters, or in exceptional cases even to 30 liters.

The males of this breed are slaughtered when quite young, and sold as veal, with the exception of the few reared for breeding purposes.

THE CHAROLAISE BREED.

The Charolaise breed is the handsomest and the most important in the central departments. Originally coming from Brionnais and Charolaise (the southwest part of the department of Saone-et-Loire), it is now bred throughout the whole Saone-et-Loire, Nievre, and Allier, as well as in certain parts of Cher, Yonne, Cote d'Or, and Haute-Loire. They are good working oxen, and furnish first-rate butchers' meat.

*The portraits of French cattle which accompanied this inclosure are inserted at page 728.

The Charolaise is recognized by its white coat of fine silky hair, its regular cylindrical body, short broad head, furnished with fine middle-sized white horns curled up toward the points, its rose-colored muzzle, large eye, and gentle physiognomy. It is short in the leg, and exhibits a well-hung tail, a very prominent and deep rump, a broad straight back, well rounded sides, a full deep chest, and a neck and shoulders carrying little dewlap.

The cow is by no means a good milker.

The sub-breed, "Charolaise-Nivernaise," the best types of which come from Nievre and Allier, is particularly worthy of notice, and superior to other French breeds from the butchers' point of view, having indeed sometimes carried off the prize in open competition with Durhams and Durham crosses.

Animals of the Charolaise breed are bought at very high prices by the farmers of the north and of the suburbs of Paris, who use them first for field labor and then fatten them for the butcher.

THE GASCONNE AND CHAROLAISE BREEDS.

The Charolaise has its center of production in the district of Carolle (Ariege), the second in the department of Gers, more especially in the arrondissement of Lombez. Both are descended from the Schwitz breed; they are essentially working oxen, and are often kept as such till fifteen years old or more.

The conformation of animals of these breeds is tolerably regular, the body cylindrical, the chest well developed, the limbs strong, the bony framework a little course, and the tail attached a trifle high. The coat is badger-gray of more or less pronounced shades, the extremities and the natural outlets generally black.

The cows are tolerable milkers.

These two breeds give rise to a brisk trade between the districts where they are reared and the departments of Haute-Garonne, Tarn-et-Garonne, Lot-et-Garonne, Aude, Hautes-Pyrenees, and Tarn, where they are much sought after for draught purposes.

THE GARONNAISE BREED.

This breed, the bulkiest of those found in the sub-Pyrenean basin, belongs to the great Gallic bovine family, and is divided into two groups—that of the valley, which furnishes the better developed animals, and that of the hills, whose members are smaller and less heavy, but more capable of work.

Garonnaise oxen are very long in the body, and often betray a faulty conformation; the sides are flat, the chest confined, the buttock short, the tail badly set on, and the osseous frame mean. Its long, heavy, busked head gives the animal a melancholy appearance. The coat is of a uniform wheaten color, the muzzle and the border of the eyelids pale red, and the horns white.

The cows are better shaped than the males, but are poor milkers. The Garonnaise breed is much esteemed for laboring purposes, on account of its colossal strength and its patience; it also fattens pretty easily.

The best centers of production are the valley of the Garonne as far as Agen, and the Dordogne valley,

THE BAZADAISE BREED.

The arrondissement of Bazas is the chief rearing ground of animals of this breed, which is nevertheless found in the departments of Landes and Gers, and in certain parts of Lot-et-Garonne and of Tarn-et-Garonne.

The shape of these animals is perfect. The chest, well let down, is broad and deep; the flank rounded, and the body generally almost cylindrical; the line of the back straight; the haunch broad, square, and well placed; the rump often very good, occasionally leaves something to desire in a good many specimens. The head is short, the forehead broad and open; the horns are often faulty.

The females may be said to be irreproachable as to shape, but they are poor milkers.

The bull is a wild, almost ferocious, animal, and extremely dangerous. From a very early age it is hardly safe to go near him, and even in the stall he has to be tied up with strong ropes. The oxen are capital workers, but always preserve their character for violence and spirit; they are extremely irritable, and much management and all sorts of precautions are necessary in leading them.

THE FEMININE BREED.

This breed, which belongs to the Comtois type, is chiefly raised on the borders of Doubs and Saone, and is met with as far as Bresse.

Animals belonging to this family are distinguishable by their light bony frame, their graceful, well-proportioned body, small head with broad flat forehead, and handsome well-directed horns, which are always brilliantly black. The eye is well placed, animated in expression, and the general aspect docile.

The oxen are capital workers, and when fattened their meat is considered second to none on the Paris market, where it is known as Chollet beef.

The cows are good milkers, and are used exclusively for milk production, never being put to draught work. On the rich pastures of Loire, along the coast from Loire to Charente, cows of this breed are often met with, which can hold their own as milkers with the finest animals known.

THE TARENTAISE OR TARINE BREED.

The small-sized breed, originally from the mountains of Tarentaise, is quiet, hardy, patient, and distinguished for its working power, and above all for its quality as a milker.

The coat is light gray, the extremities and the natural apertures black. In the bull the coat is more frequently badger gray, black on the neck, cheeks, and lower parts; in the cow it is tawny, or of a gray wheat color, observable in no other breed.

The trunk is compact, the leg short, the sides rounded, the head short, the forehead broad, the horns well set on, the eyes large and mild.

These animals are eminently fitted to replace sheep on the Alpine pastures, and yet maintain their fitness for the Mediterranean littoral, despite the heat of the climate.

THE BRETONNE BREED.

The Bretonne breed, which would appear to have originally come from the department of Morbihan, is met with in the five departments forming the ancient province of Brittany, with the exception of a portion of Loire-Inferieure, where the Parthenaise and Nantaise breeds are kept, and the confines of Ille-et-Vilaine, where Normandy stock is preferred.

Bretons are hardy, docile, and good workers.

The cow, which has been justly described as the milker *par excellence* of poor districts, is small and squat, the limbs are short and rather slim, and the extremities particularly slender; the head short, the eye vivacious, the muzzle black, occasionally mottled, and rarely white; the horns thin and white at the base, but occasionally dissimilar; the coat generally pied black, the skin fine, lissome, and readily detached, the gait quick and decided, and the disposition mild and sociable.

In the more fertile and better cultivated parts of Brittany animals of the Bretonne race are more developed and exhibit a better shape generally.

On the north coast, and in Finistere especially, pied chestnut animals are met with, having some resemblance to the Channel Islands breed, so specially remarkable as milkers. Most of these are the result of crosses with bulls other than those of Brittany, the object in view having been to increase the size of the Bretonne breed.

DURHAMS AND DURHAM CROSS-BREEDS.

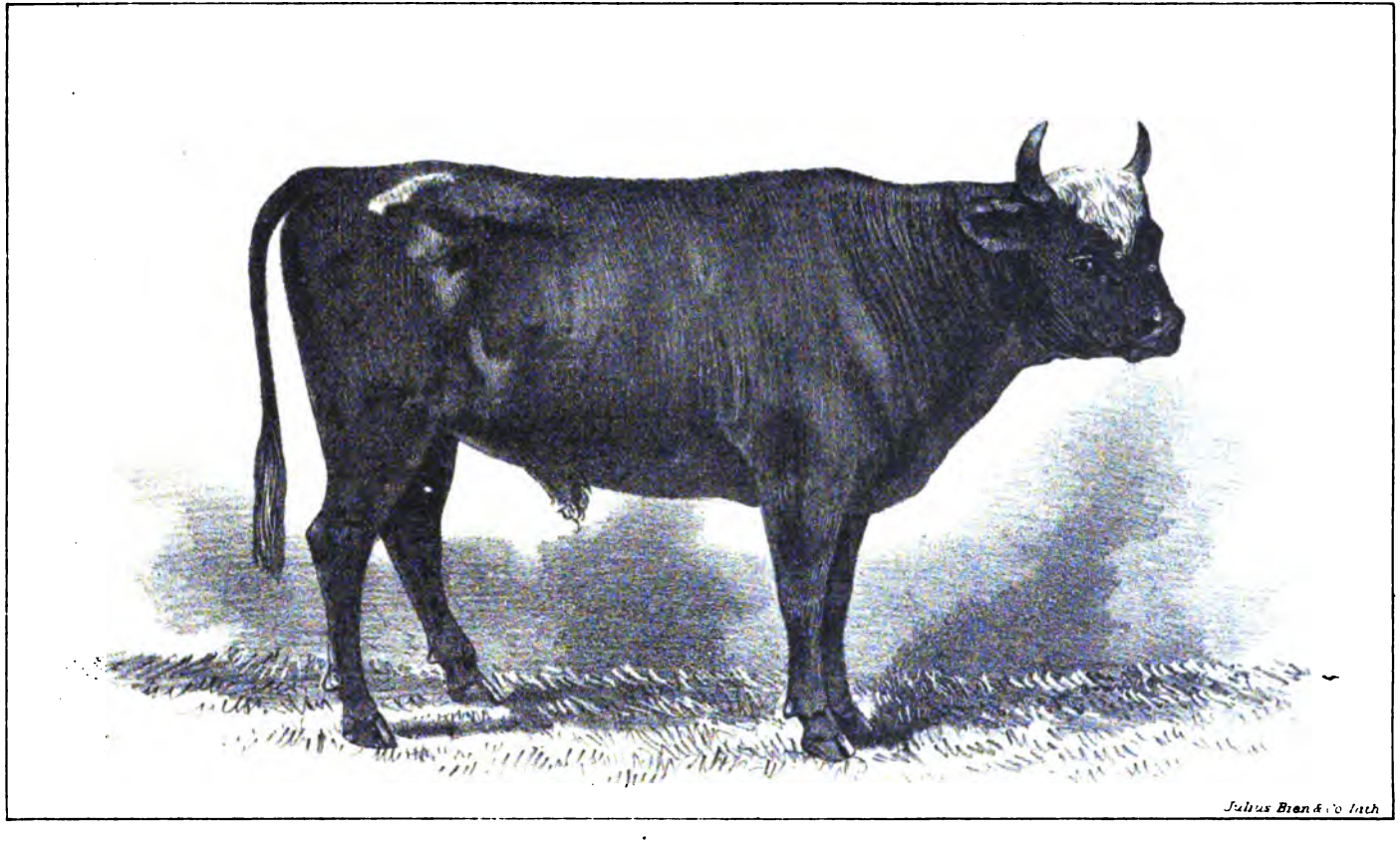
The Durham breed was introduced into France in 1838 by the "Administration de l'Agriculture," ably seconded by MM. Aug. Yvart and Lefebvre de Sainte-Marie.

It was at first located at the Pin Stud Farm, but since 1861 the experimental breeding station has been transferred to Corbin, in Calvados. The foundation of this establishment has had a great influence on the progress of French agriculture, by showing stock-owners the advantages of early maturing breeds.

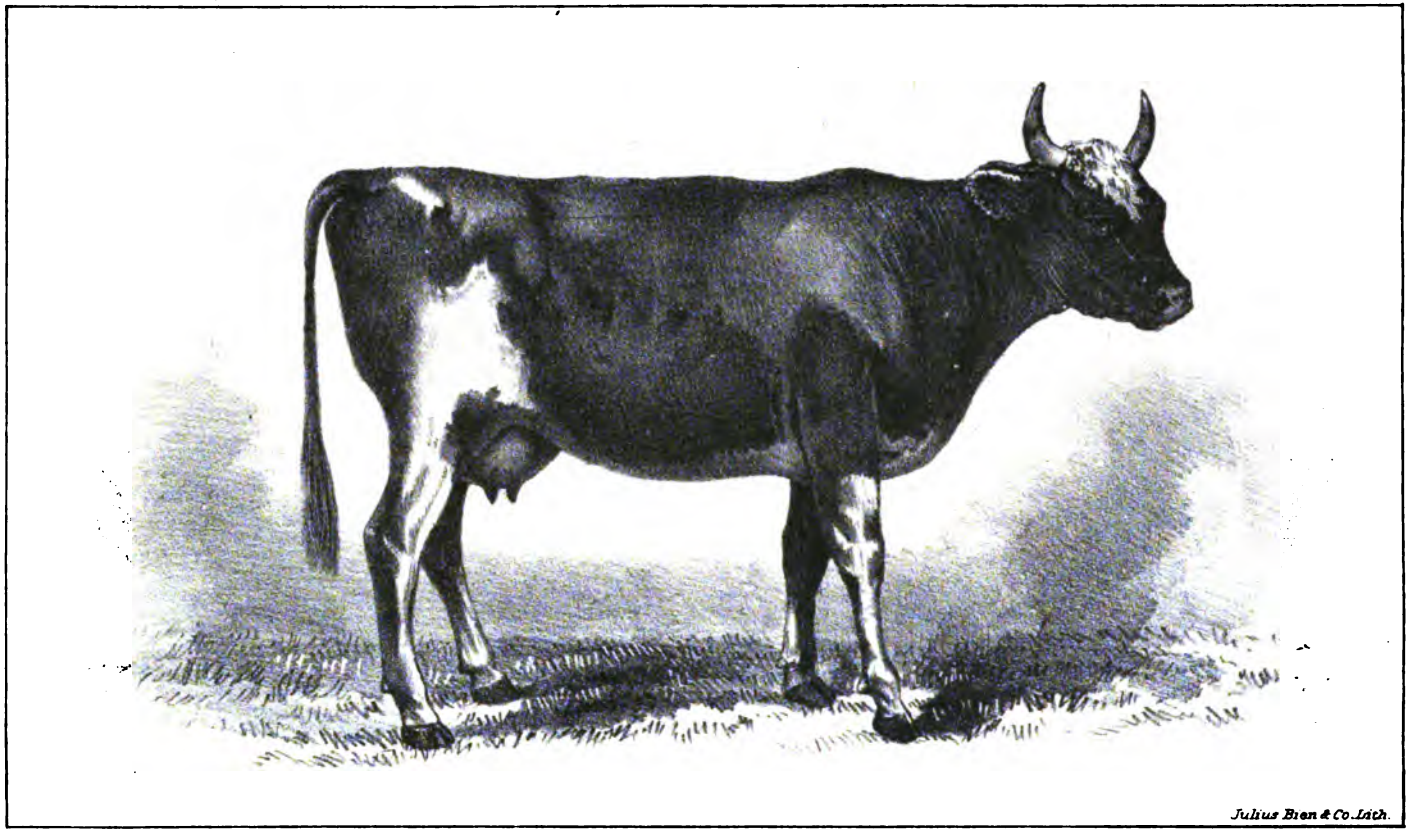
The distinctive qualities of Durhams are their extraordinary aptitude for putting on flesh, and their great precocity which allows of their being slaughtered at three years old, or a little more, and always at less than four years. The shape of the Durham ox, called in England the "Shorthorn improved," is perfect from the butcher's point of view.

Durhams are less difficult to rear than might be supposed, and they succeed perfectly well under favorable conditions. They have increased largely in the departments of Maine-et-Loire and Mayenne, where they are maintained pure, and are met with here and there in all parts of the country. Numerous breeding stations have been established, and are answering well, in Cote-d'Or, Finistere, Ille-et-Vilaine, Loire, Orme, Sarthe, Seine-Inferieure, and some other departments of Central France.

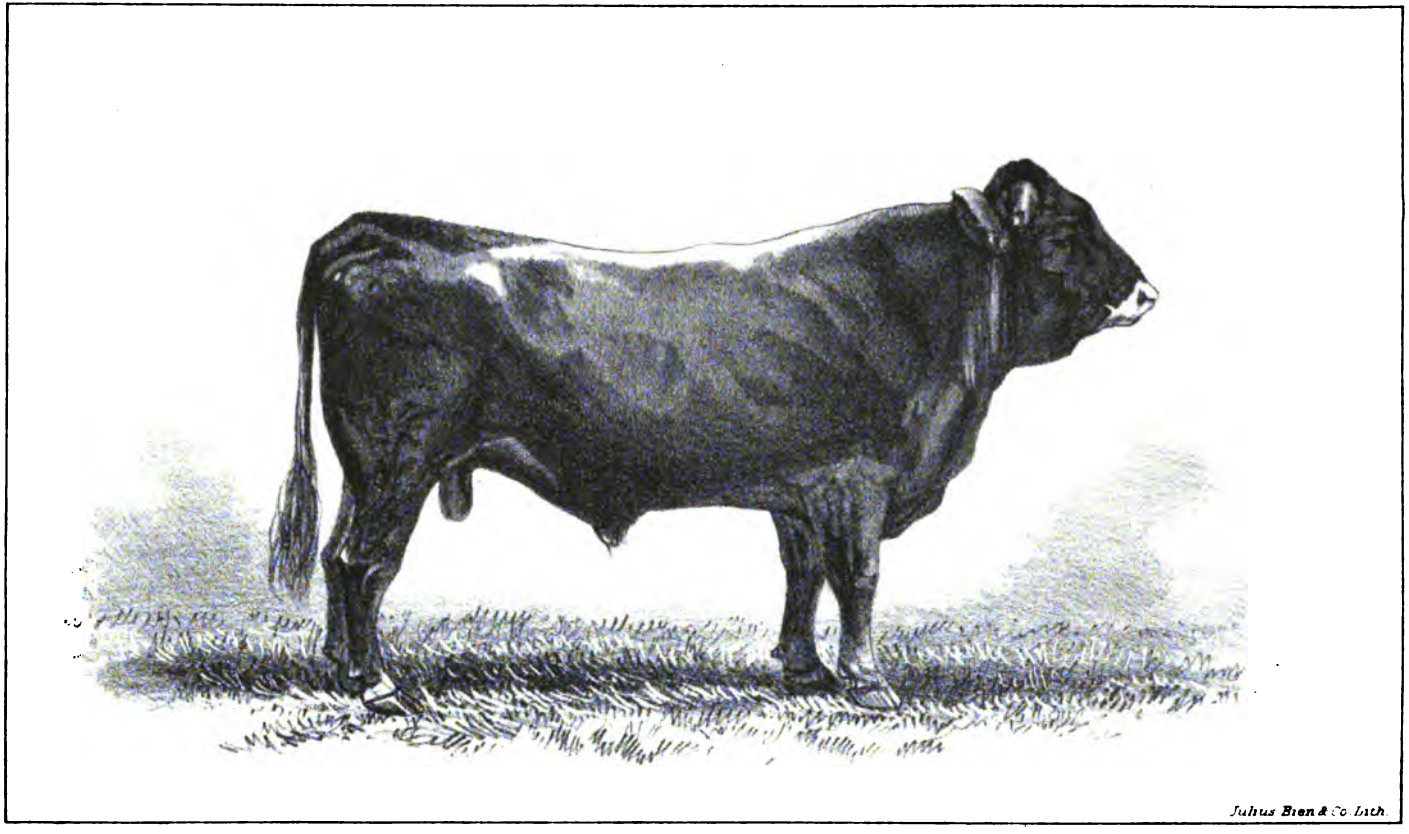
The French "Herd-book," eight volumes of which have now appeared, shows that more than 19,000 Durham bulls and cows have been used for breeding purposes in France since 1838, and that the bulls especially have contributed much towards the creation of a considerable number of desirable crosses.



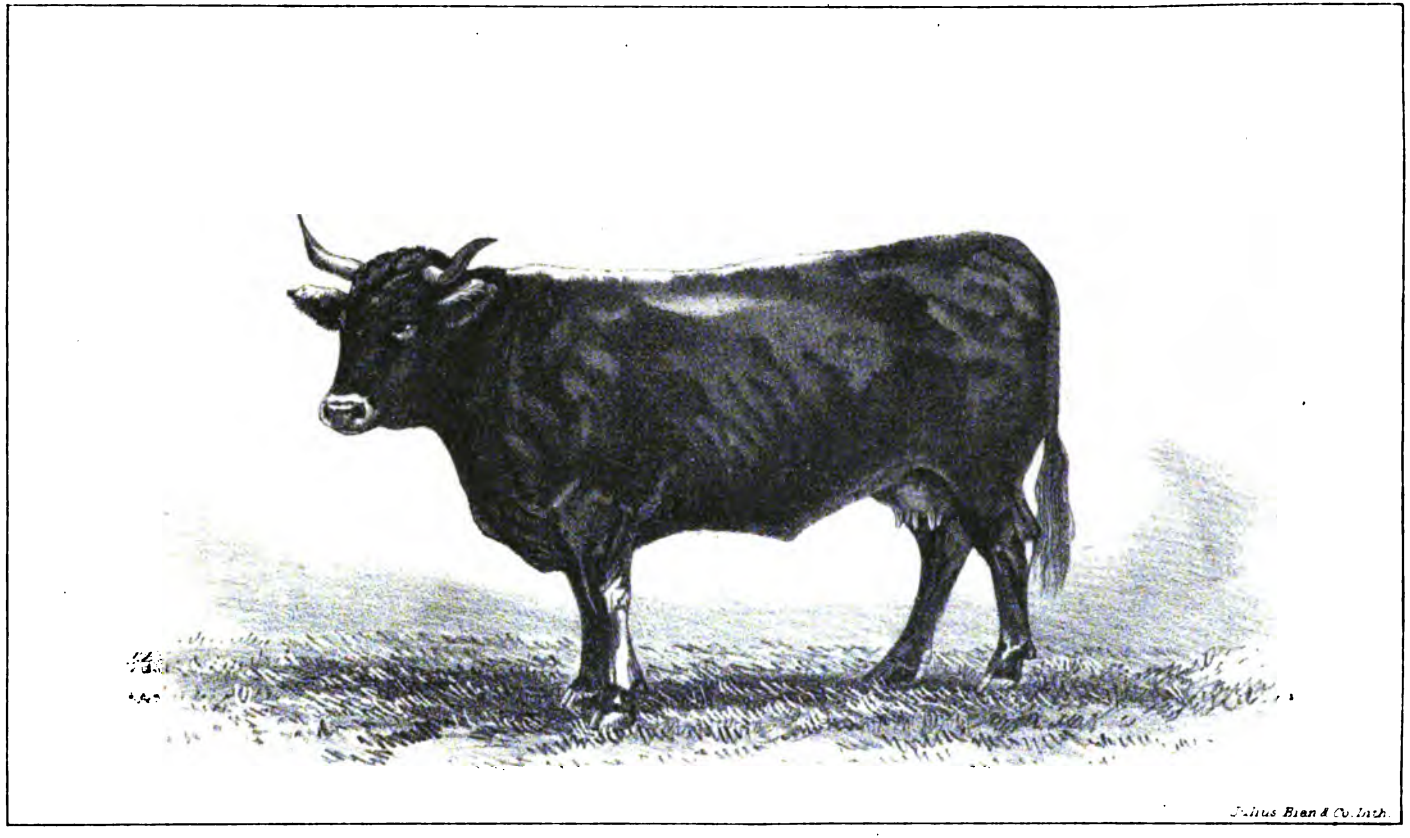
FRENCH BULL



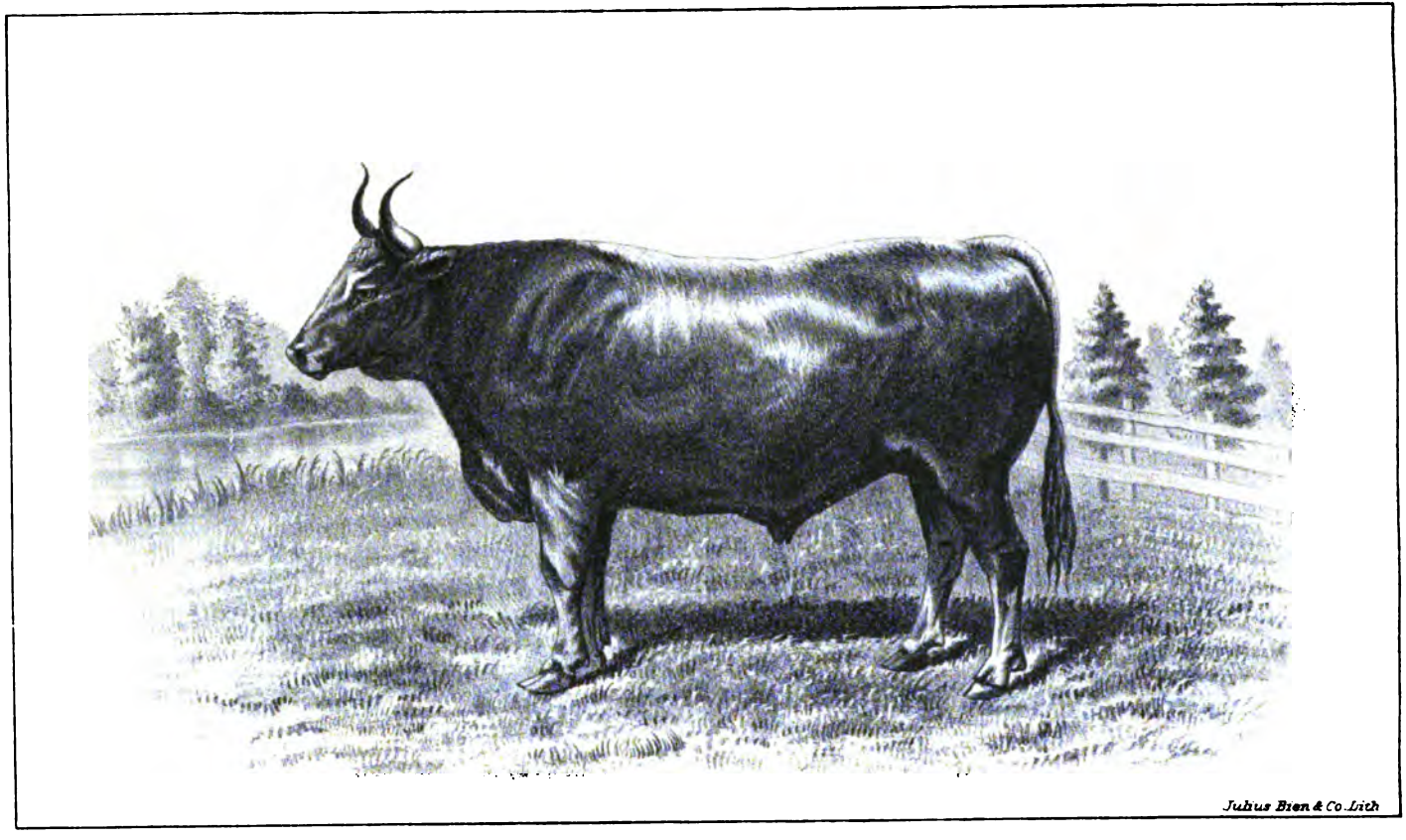
FRENCH COW



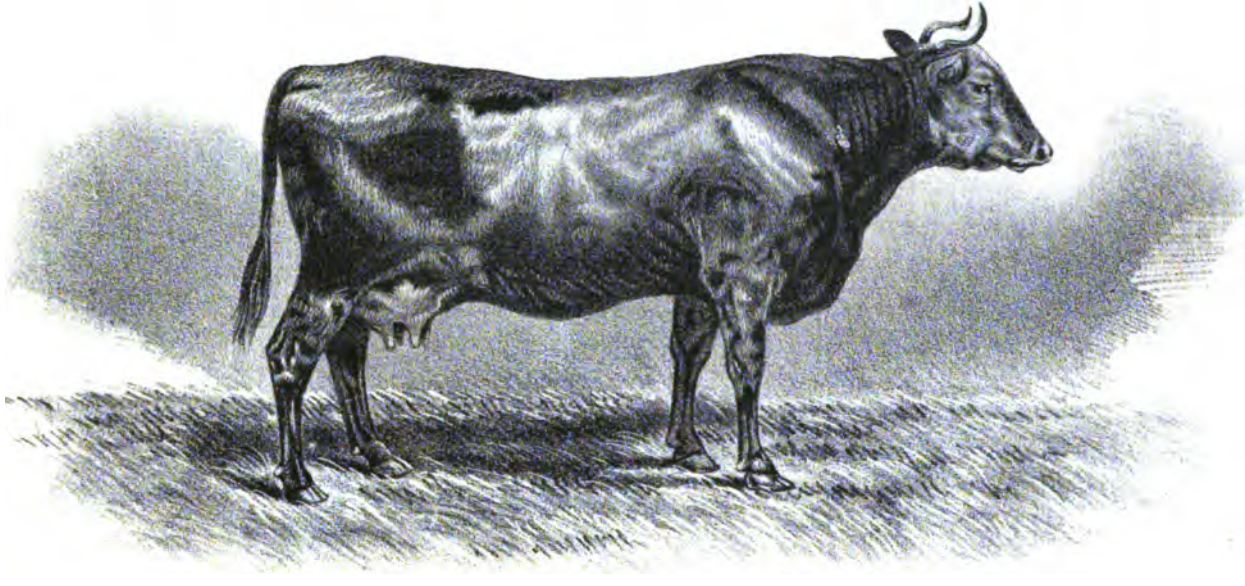
FRENCH BULL



FRENCH COW

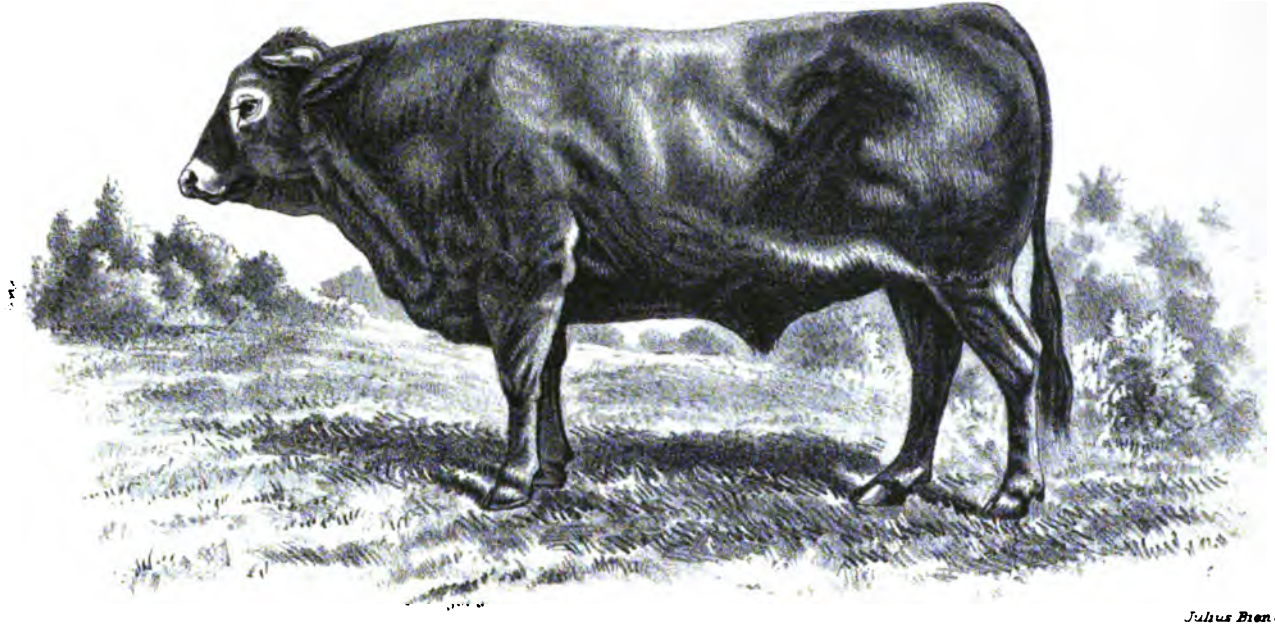


FRENCH OX

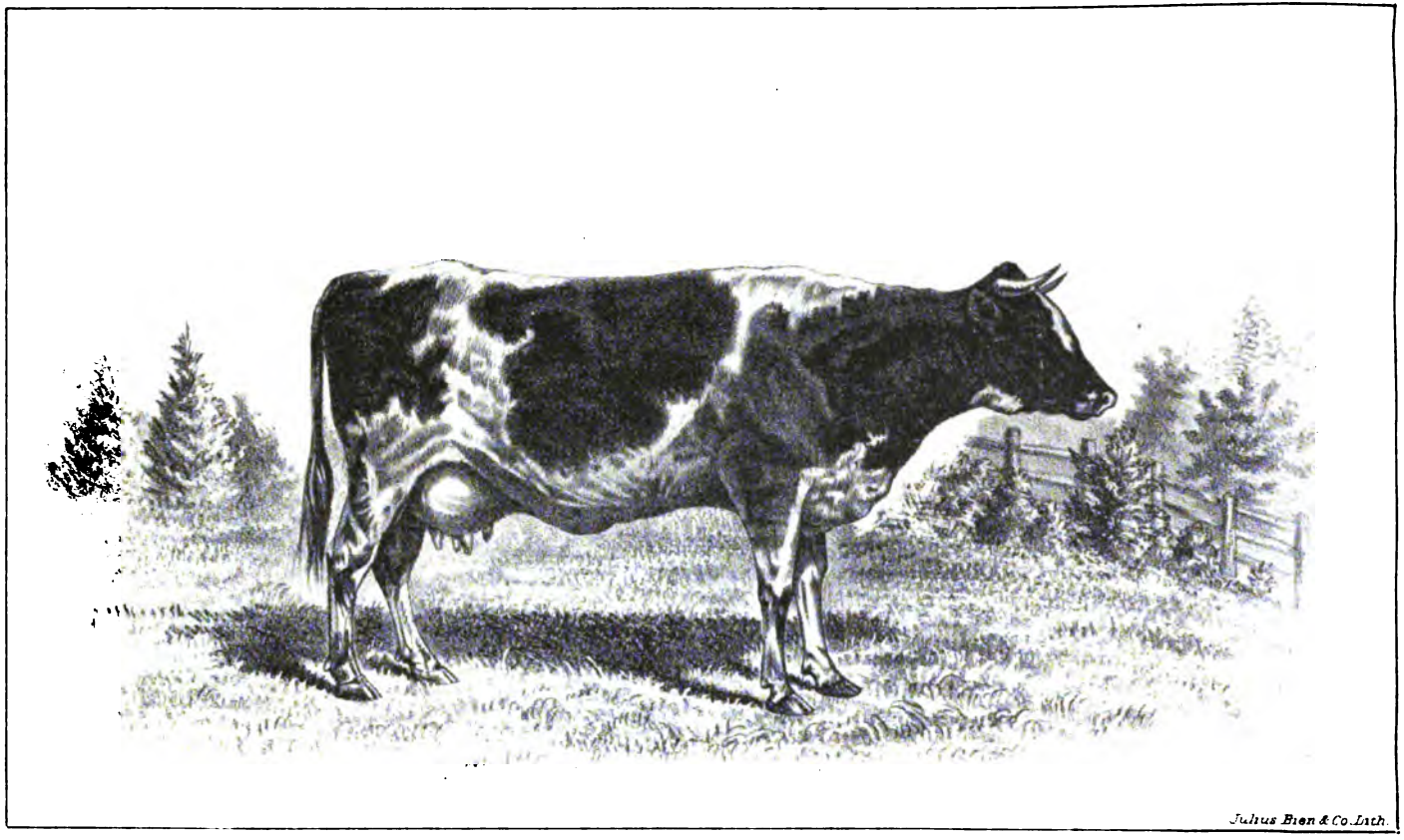


Julius Bien & Co. Lith.

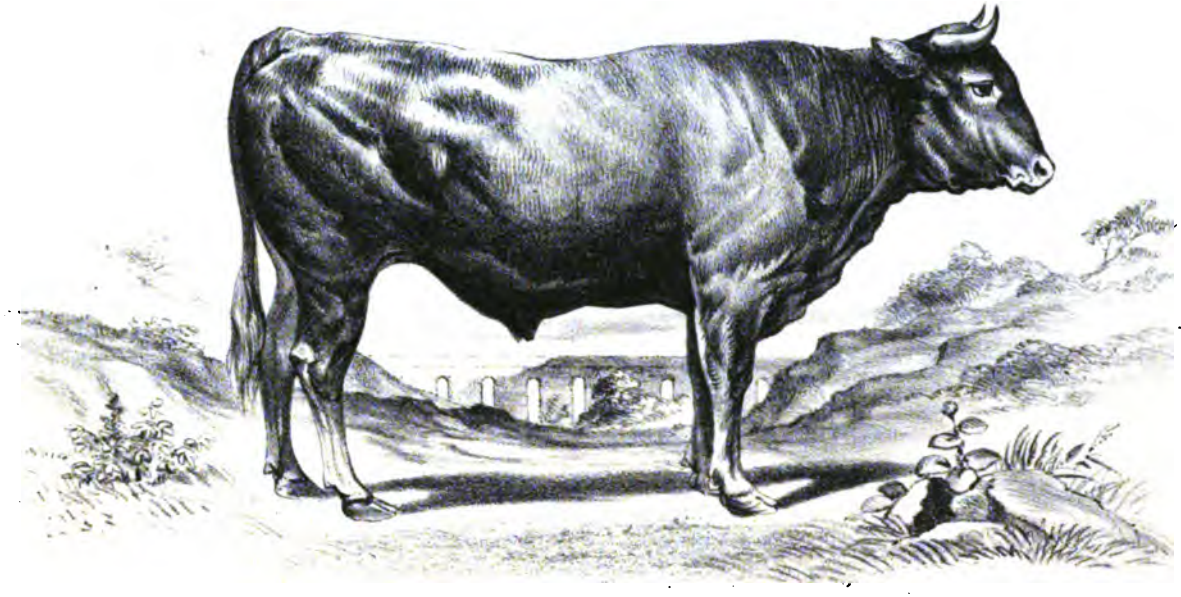
FRENCH COW



FRENCH BULL

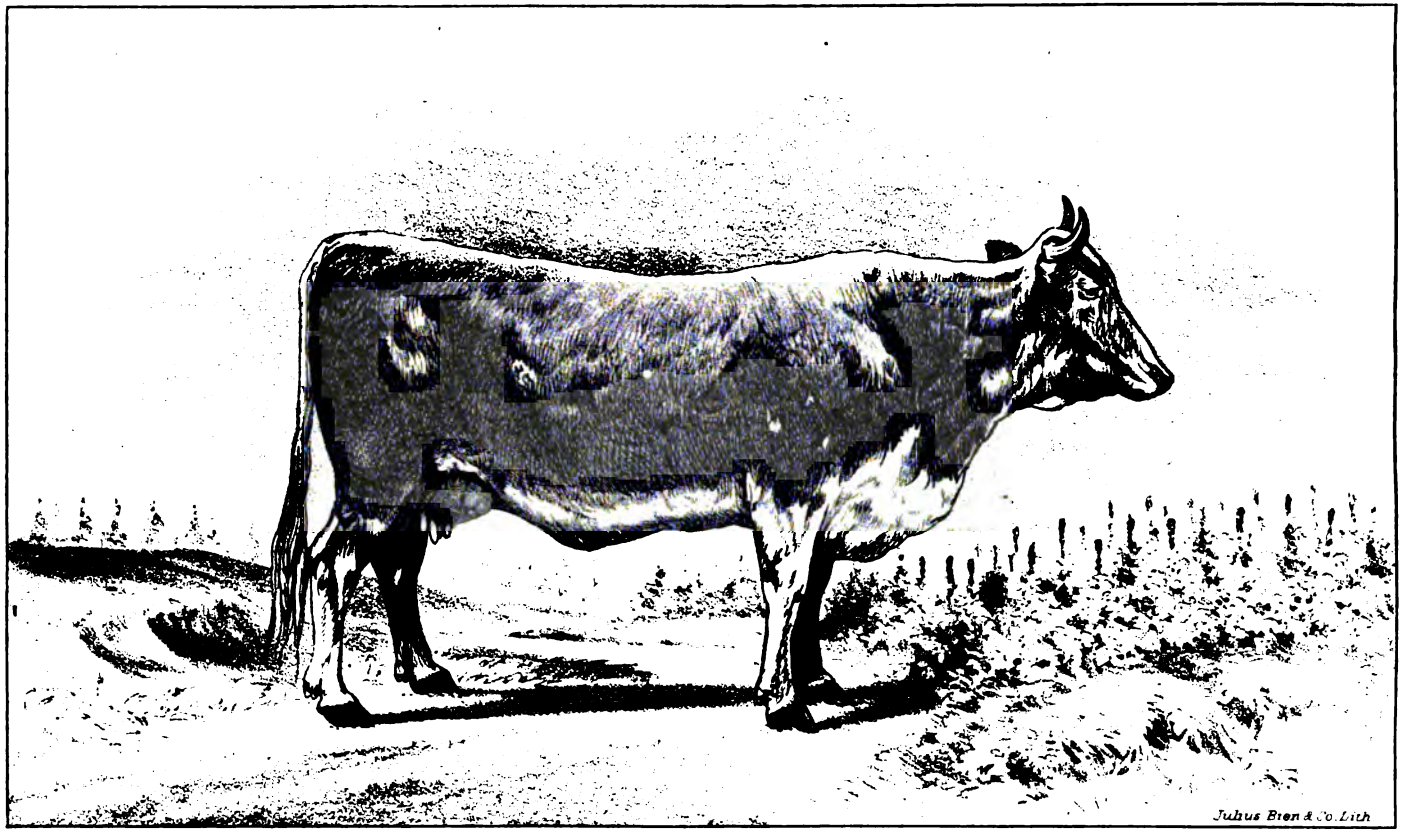


FRENCH COW

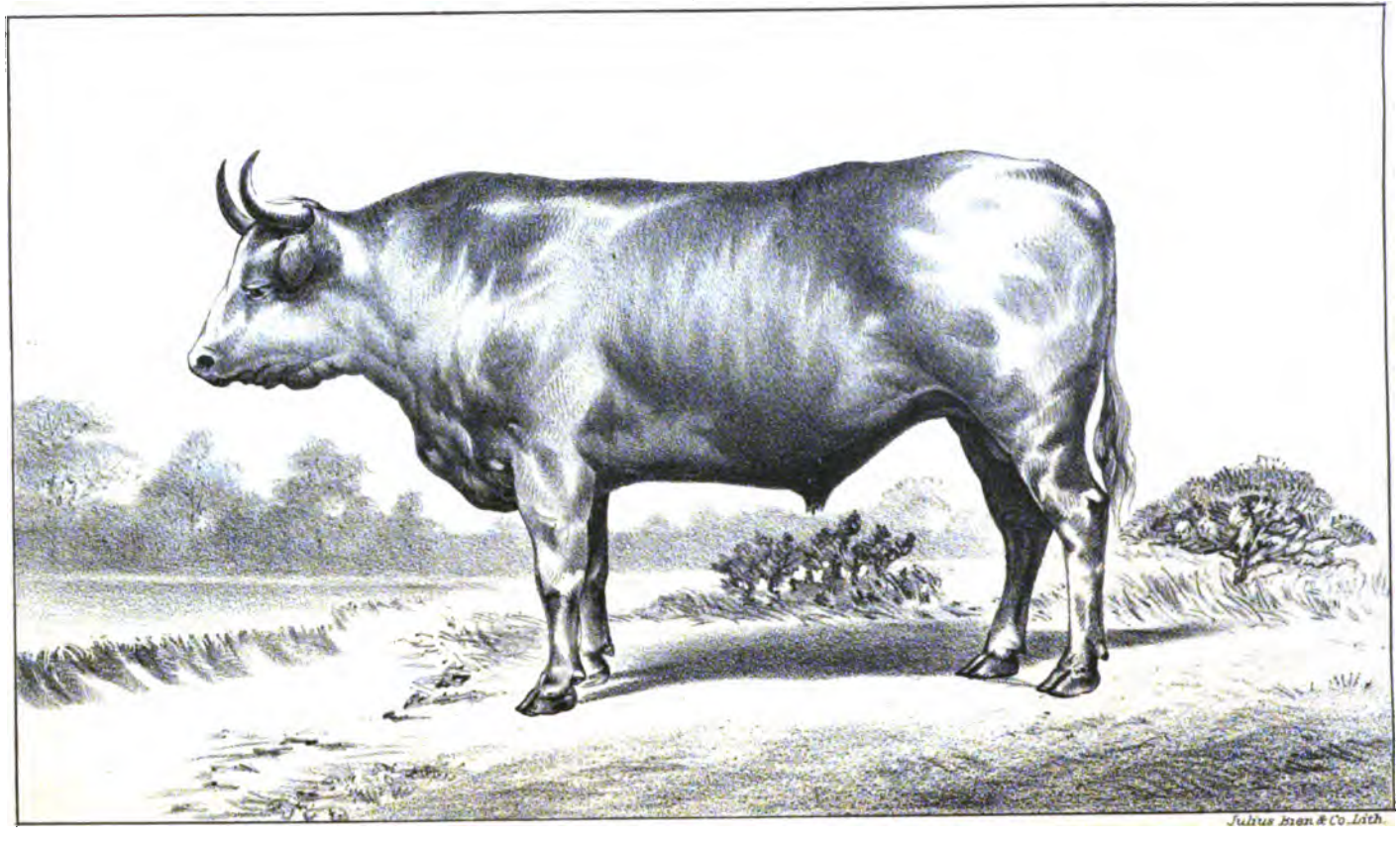


Julius Bien & Co. Lith.

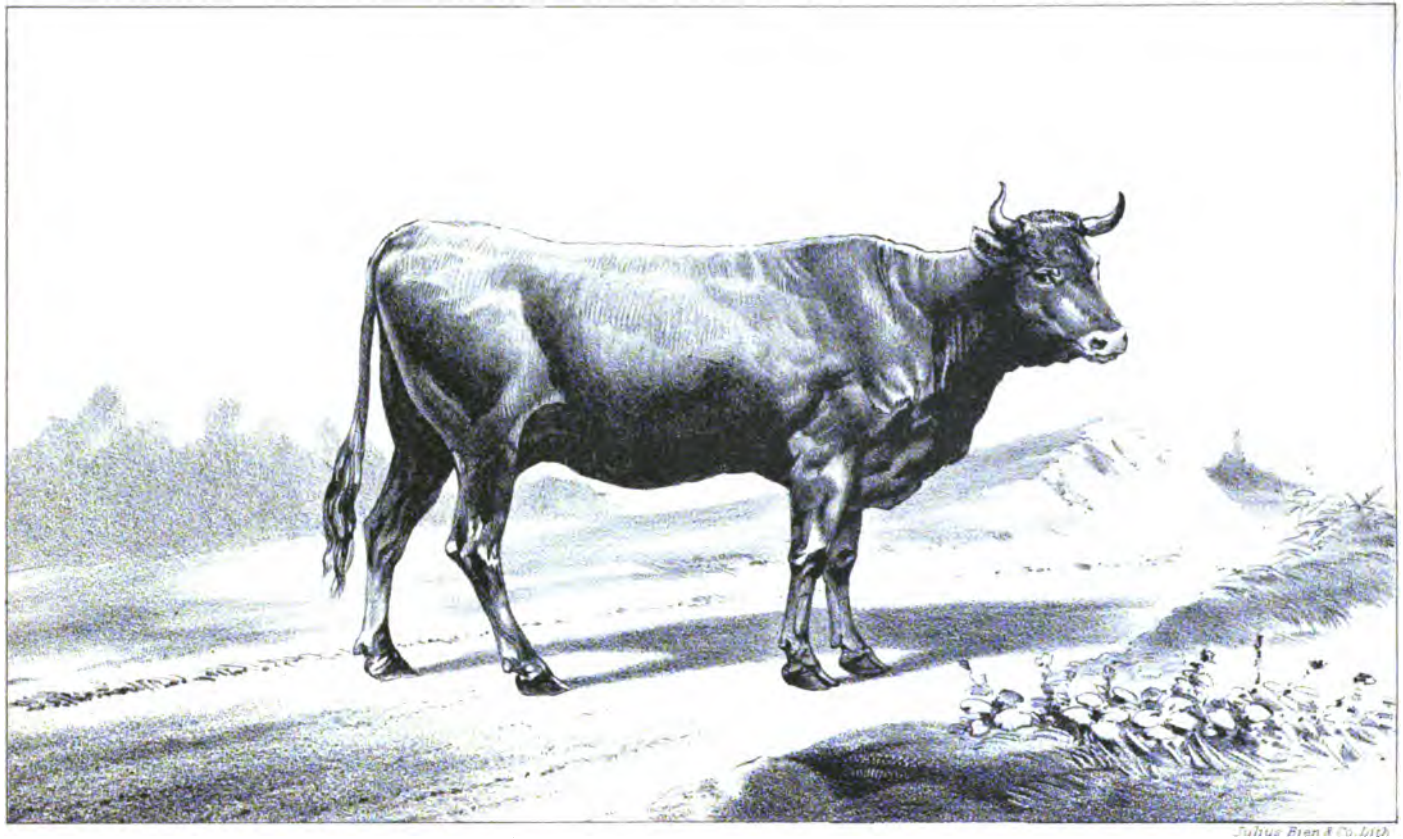
FRENCH BULL



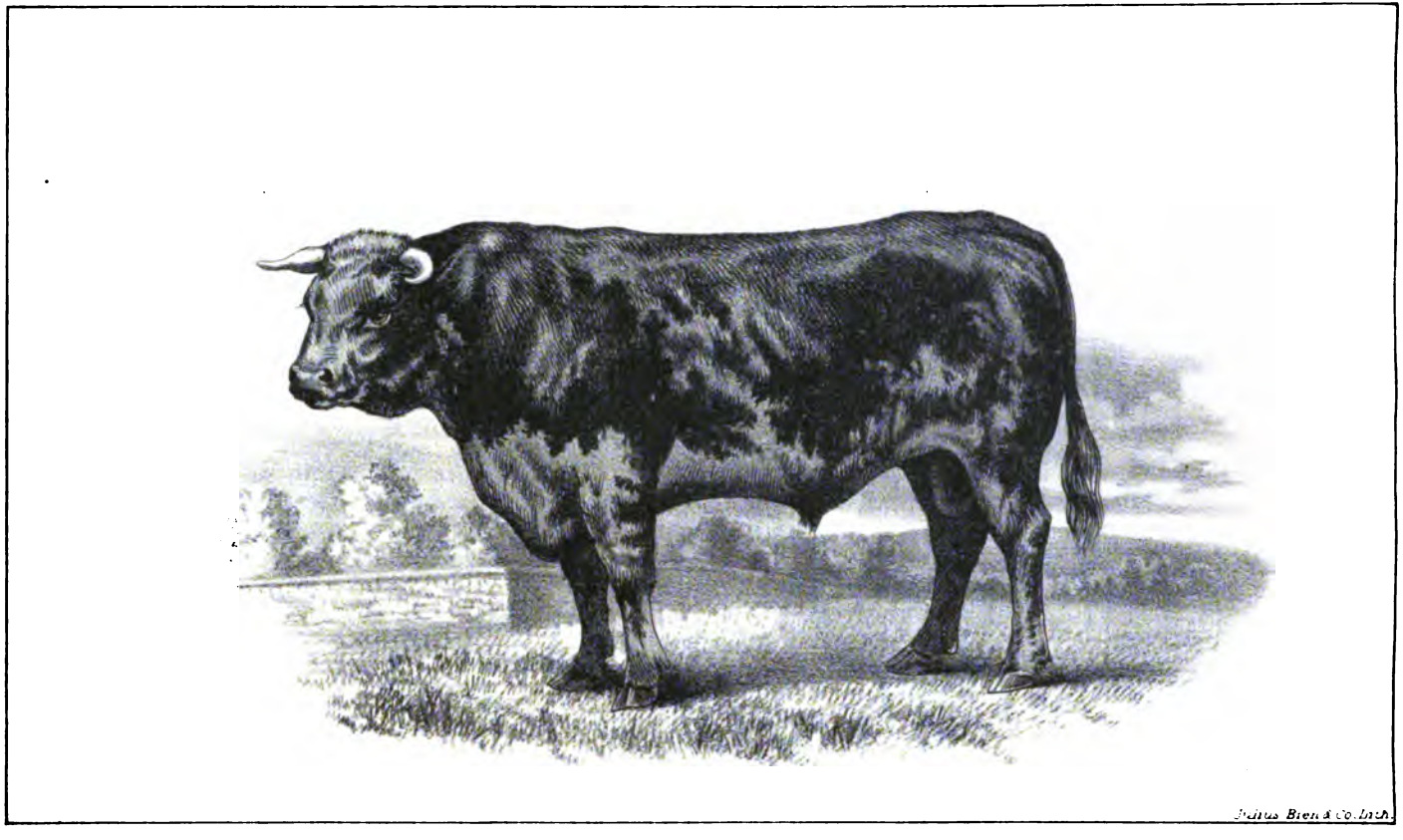
FRENCH COW



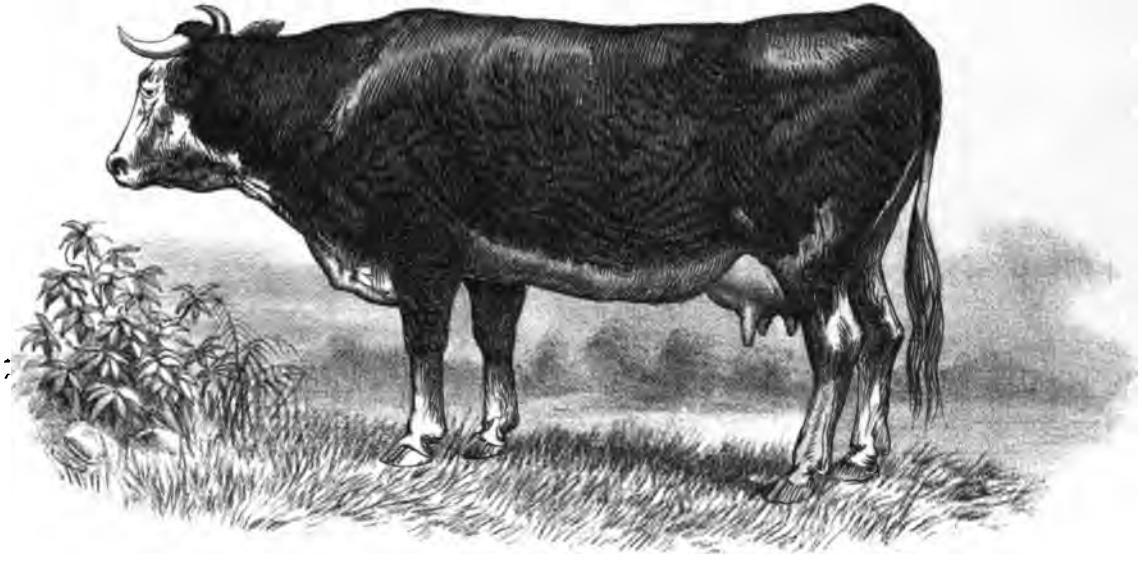
FRENCH OX



FRENCH COW

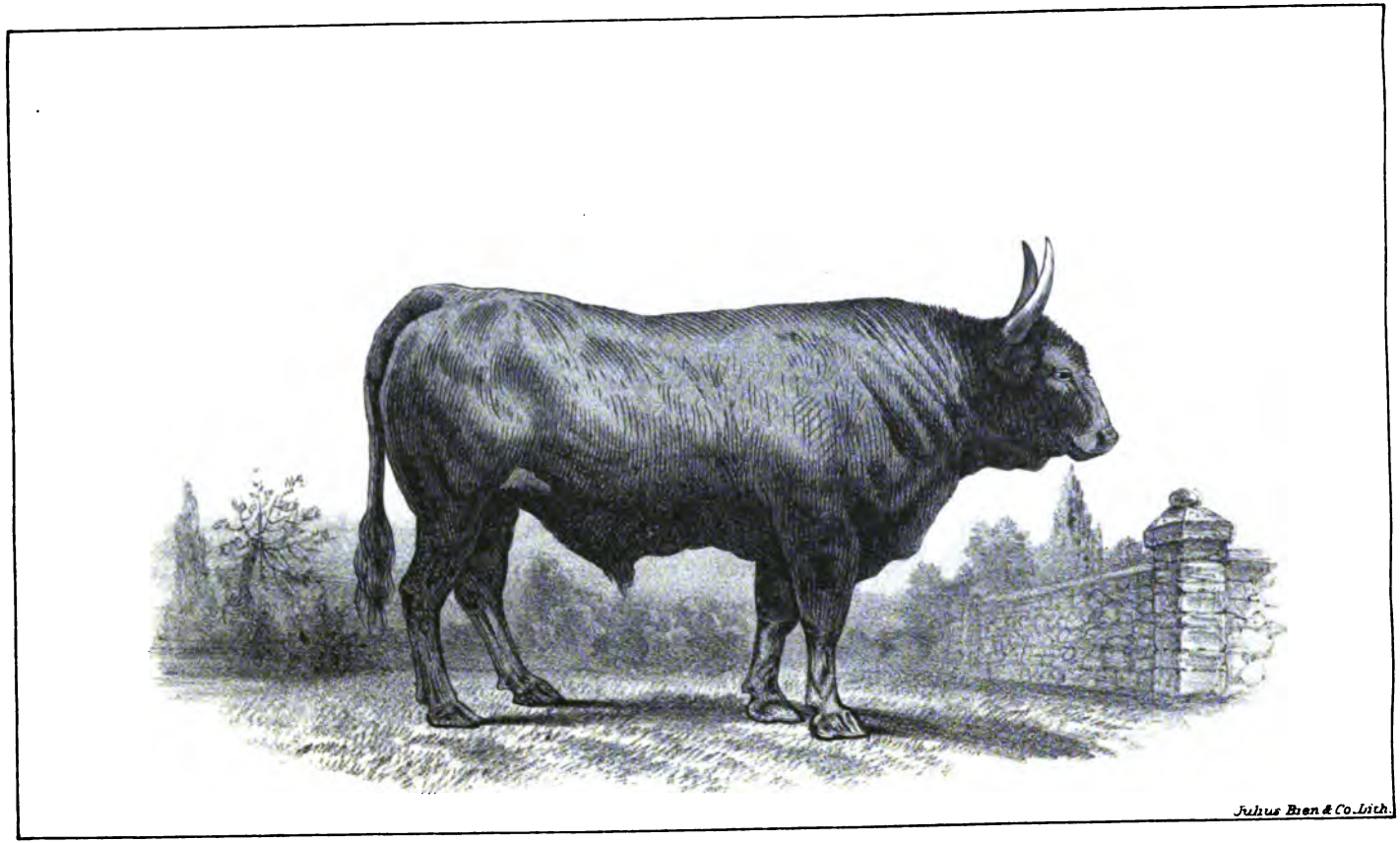


FRENCH BULL

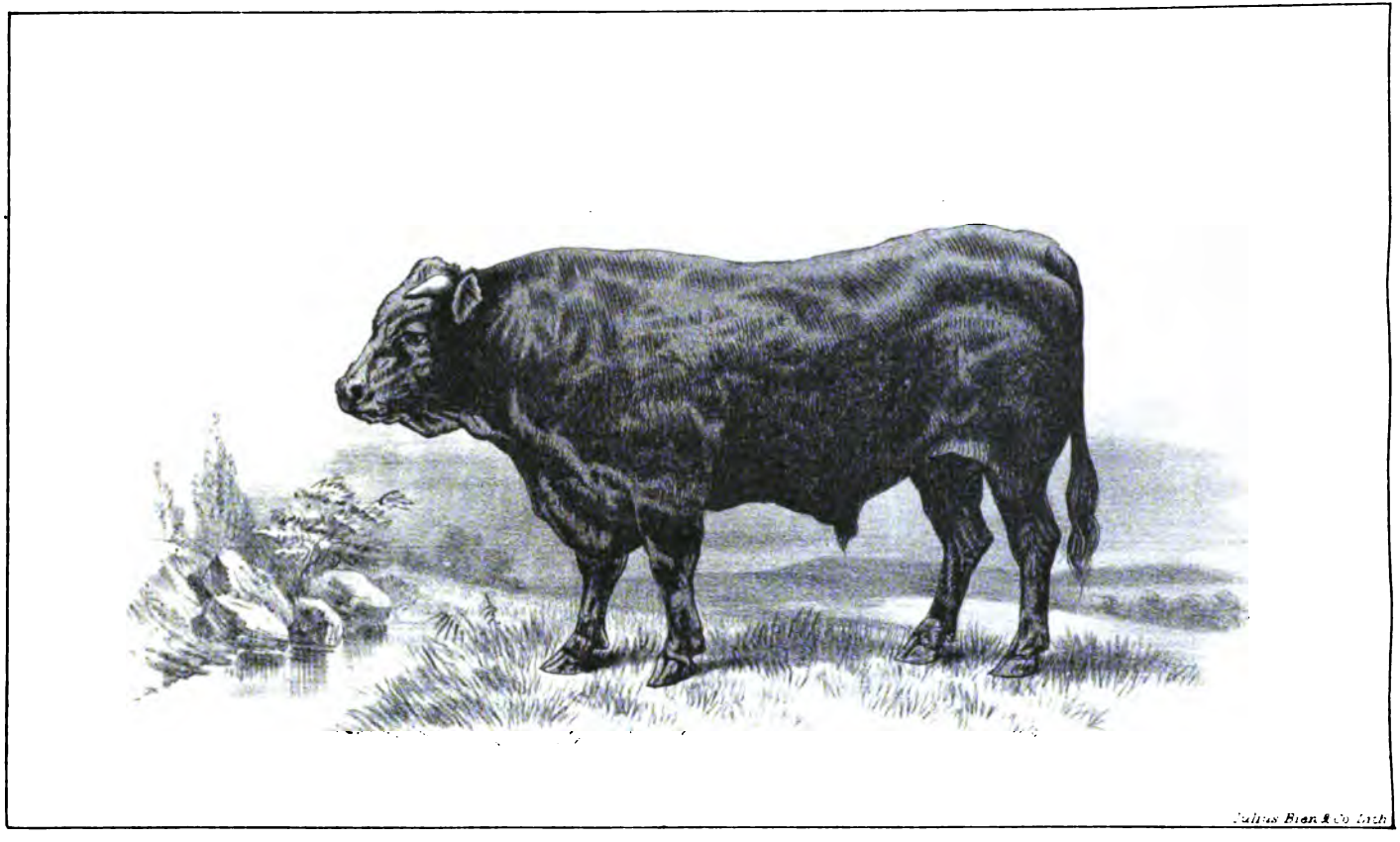


Julius Bien & Co. Lith.

FRENCH COW



FRENCH BULL



FRENCH BULL

It is more particularly in the department of the West that Durham cross-breeds have been most numerous, and that their influence on the condition of agriculture is most appreciable. At the present time the superiority of English blood for getting good crosses for the butcher is beyond dispute.

FRENCH CATTLE.

[Reports contributed to The Field Newspaper, February, 1883, by H. Kains-Jackson. Inclosure O O in Consul-General Merritt's report.]

FAT STOCK IN FRANCE.

PARIS, *February* 1, 1883.

The Agricultural Implement and Fat Stock Show in Paris, under the auspices of the ministry of agriculture, and supported by the chief land-owners, stock-breeders, and machine-makers of the country, has just been concluded, and I send a list of a few of the chief prizes, reserving remarks for a letter next week. Of fat stock there were 345 bullocks and cows, 91 lots of sheep (the pens being sometimes of three or a score), 120 lots of pigs; whilst of poultry, rabbits, and pigeons the numbers were 2,400; and, as a special and new feature of this season, there were on show 68 young bulls, 63 rams, and 23 boars. Added to this goodly collection were 318 lots of dead poultry, and large collections of roots, vegetables, corn, grass, fruit, butter, cheese, oil, &c. The implement show consisted of 4,500 diverse machines and agricultural appliances and tools. The show of the latter was open on Tuesday week, but was scarcely visited until the cattle show judging commenced on last Saturday; and catalogues and prize lists were issued on the first "franc day" (Sunday). The exhibition closed on Wednesday, after proving a successful attraction to the Paris people and country inhabitants of the departments generally.

PRIZES.—First prize for bullocks born since January 1, 1880, H. Signoret, of Sermoise, Nievre. First prize, bullocks born since January 1, 1879, M. Nadaud, of Chazelles, Charente. For breed prizes, Charolaise and Nivernaise, the first was taken by M. Bellard, of Saint-Aubin-les-Forges, Nievre, with a white Nivernaise beast, weighing 19 cwt. 1q r. 6 lbs., No. 64, aged 45 months. The first prize for the Limousine breed was awarded to M. Parry, of Limoges, Haute Vienne, for a red animal weighing 19 cwt. and 16 lbs., aged 46 months; number of catalogue 83. For Garonnaise breed, No. 107, belonging to M. Bernede, of Meilhan, Lot, and Garonne, for a light dun, aged 4 years and 2 months, and weighing 1 ton and 28 lbs., took first prize. For the Baradaise breed, M. Chambaudet, of Meilhan, Lot, and Garonne, won first honors with No. 115, aged 40 months, and weighing 15 cwt. 3qrs. 12 lbs. The grand race of Salers, the largest in France, was represented by the handsome red beast of M. Valtau, of Vindelles, Charente, aged 4 years and 1 month, but the weight of which was only 19 cwt. and 8 lbs. The first prize of the breeds Parthenaise, Chotelaise, and Nantaise was taken by No. 132, M. Poinet, of Léché, Vienne, for a gray Parthenaise animal, aged 5 years, and weighing exactly the same as the Salers beast, 19 cwt. and 8 lbs. Of the breeds Flanders, Normande, Mancelle, Femeline Bourbonnaise, Comptoise, &c., the first prize was awarded to M. Jaques Bellard, of Cours les-Barres, Cher, for No. 138, a Bourbonnaise, aged 4 years 2 months, weight not given. No. 148, owned by M. Rousseau, the elder, of Bordeaux, a dun Basquais, aged 4½ years, and weighing 19 cwt. and 32 lbs., took the first prize for the breeds Bearnaise, Basquaise, Aubrac, Mezenc, &c. The first prize for the Brittany breed was taken by M. Jean Brosier, of Saint Loup, Allier, for a black and white beast, aged 4 years 4 months and 10 days, weighing 11 cwt. and 10 lbs. The prizes of honor were given to M. Signoret for No. 26, a Durham-Charolaise; to M. Mativon, No. 234, also for a Durham-Charolaise; and to M. Gustave Valtau for his Durham-Manceau group of four beasts.

LIVE STOCK IN FRANCE.

The great show of cattle, sheep, and pigs, of poultry, agricultural produce, and implements, held last week in Paris, and which represented all France and some of its colonies, must include many points of interest to the readers of The Field. Under the auspices and control of a ministry of agriculture, and with such a magnificent and central site as is afforded by the Palace of Industry in the Champs Elysées, the exhibition formed a great display of rural economy. It is of the cattle that I have chiefly to speak, and, knowing France well in its country aspects, I may say that the various breeds brought together must have astonished and pleased any lover and critic of animal life. Contrasted with English breeds, the cattle were most conspicuous by their light and even color; the sheep by being shown out of their wool, and from the relative absence

of all heavy stock; whilst the pigs looked very much like their English brothers, and in fact were often more than half-and-half British blood.

It may be noted of "how they do these things in France," that each set of the judges is complemented by a member elected by the exhibitors in the respective sections. Certainly this is a commendable method, that might be introduced in English shows. In Paris more than a dozen gentlemen were thus assisting in awarding prizes.

The entries may be thus grouped:

Cattle	369
Sheep pens	92
Pigs	125
Bulls	68
Rams	63
Boars	23

Besides 2,369 pens of live poultry, pigeons, rabbits, &c.; 3,477 exhibits of roots, seed, fruit, vegetables, &c.; and 320 of dressed poultry, 487 of cheese, 217 of butter and milk, all of these being inside the building, whilst outside, occupying ample space on the walks and roads adjacent, the implement entries numbered 3,478, including a working butter-maker and Laval's cream separator.

The center of the large transept formed an admirable and roomy space for the exhibition of cattle, for the circulation of the public, and the task of the judges. There was abundance of litter, and in all respects the feeding and comfort of the animals left nothing to desire. The central and side passages were kept like garden walks, and shrubs and flowers in the center formed an ornament and a rendesvous where friends could meet. Under the galleries, corresponding to those of Islington, the great display of poultry, in wire-fronted boxes, flanked the live stock, whilst at either end of the vast building were the sheep and pig pens. Upstairs some thirty large rooms—the salons for pictures in May—were filled with cereal, seed, root, forage, and other agricultural produce, including oil and honey. As farm produce hops were missing, nor were there many exhibits of manures, phospho-guano only being well represented. The cheese, butter, and dead poultry exhibits were excellent and very numerous; and poultry appliances, including many incubators, made an exhibition of themselves. In one of these salons the English visitor might see with natural curiosity the inviting exhibit of sausages formed from the meat of beasts of burden—horses, mules, and donkeys—the latter being especially recommended at 10*d.* to 1*s.* 3*d* per pound. Many persons tasted the tempting slices offered them, and judges rank asses' flesh as savory food. So good indeed is it, that "Pate de foie d'âne" formed a display after the fashion of our "Pimlico pies." Looking from the galleries, where knicknacks were sold, the scene of animal life below was cheerful and picturesque. The great blotches of color were more distinct than in an English show, as the breeds of cattle—white, cream white, dun—gave much the same impression as do a number of harvest fields of different grain, one tone being general. Of course there were red and roan and pied animals, but these were in a minority, and there were no classes of black cattle, Scotch polls, Welsh, and Irish to attract notice. This omission of black color from a fat-stock show was a notable feature.

As a curious piece of animal statistics may be given the following particulars of the prize animals killed and analyzed a year ago, only the chief being here given; and as French weights and figures serve for comparison as well as do English ones, the official report is quoted. It may be stated briefly, however, that a kilogram is equal to 2¼ pounds, and 50 kilograms are close upon a hundred weight, and 1,000 kilograms a ton.

Breed.	Live weight.	Weight loss when killed after show.	Weight of four quarters.	First quality.	Second quality.	Third quality.	Suet.	Water in each 100 grams of lean meat.	Price made of animal.	Age in months and days.
	Kilos.	*Kilos.*	*Kilos.*					*Grams.*	*Francs.*	m. d.
Durhham-Charolaise	926	46	608	223	149	140	80.000	69.635	2,025	32 17
Bazadais	944	39	594	307	120	130	77.000	59.325	2,000	54 00
Salers	906	41	590	231	154	139	76.300	.....	1,910	48 00
Parthenais	877	32	534	195	168	160	91.500	61.350	1,920	64 00
Basquais	897	42	504	230	171	118	73.500	58.500	*6,000	54 00

* Probably for exhibition.

Further, as regards loss of weight on being killed, the fat Norman only lost 8 kilograms, whilst Yorkshire lost 19 kilograms, and the big Yorkshire-Limousin but 7 kilograms.

I am hopeful of getting similar returns to the above of the cattle, sheep, and pigs at the present year's show, especially those referring to the two beasts exhibited by the Vicomte de Chezelles; which were fed on ensilage.

To give any adequate idea of the Paris Exhibition, it is necessary to run through the several classes, of which the first prizes were published in last week's Field, which represented the live stock of France, from its great plains, river valleys, and mountain-sides and table lands.

In Class 1 of young bullocks, born since January 1, 1880, were twenty-six entries competing for eight prizes, all of which were awarded, and a supplementary prize was added, whilst two animals were honorably mentioned. Many famous breeders competed in this class, of which nearly every entry had Shorthorn blood, the exceptions being a Nivernais, Basquais, Bazadais, Limousin, and Charolais-Nivernais animal, five in all out of twenty-six. Of the eight prizes, six were Shorthorn crosses, the sixth prize falling to a white Nivernais, and the eighth prize to a Charolais. The first prize was to a Durham-Charolias, the second to a red and white pure Shorthorn. The weights of all were good, but I should not consider any beast satisfactorily ripened.

Class I, section 2, was for bullocks born since January 1, 1879, and the extra year brought together thirty-six animals. Four to six years of age would appear most in favor in France at present for exhibition, as two to four years are in England. On this point, one should remember that the greatest proportion of oxen have two or more years at the yoke as draught animals.

Again, in this fine class Shorthorn crosses formed two-thirds of the total; but the heaviest beast was a white Charolais, which weighed 1 ton and 44 lbs. at forty-seven months old. The first prize of the class was a Durham-Charolais, red and white, weighing 19 cwt. and 14 lbs., age forty-two months. It was M. Nadaud's prime exhibit, and fought for the championship of the show against the Durham-Charolais of M. Signoret, which, a year younger, weighed within 60 lbs. of the older animal, and was judged by points a neck ahead, and so carried off the prize of honor. Generally, the animals in Class I woul dhave been a fine display in any country.

Class II had the interest of being one of breed, and without distinction of age. There were nineteen entries, all of the Charolaise and Nivernaise breeds. The ages ranged from three years nine months to seven years, the majority being four or five years old. In this class a white Nivernais turned the scale at 22 cwt. 3 qrs. 91 lbs., the age being four years six months and twenty days. It gained a supplementary prize. These breeds are the chief working oxen of France, and until lately were not fattened until eight or nine years of age. The meat of these animals after four years is mature, savory, and highly nutritive. The first prize was taken by a white Nivernais, the youngest but one in the class.

Of these famous French breeds, the leading points are: They are handsome, good working oxen, and make first-rate butchers' meat; the coat is usually creamy white, with abundant hair; they have white middle-sized horns, turned up towards the points; the head is short and broad, the muzzle rose-colored, the eye is large, and the aspect gentle; a regular cylindrical body is set on short strong legs, the neck carries but little dewlap, the back is straight, ending in a well-hung tail, and the rump is prominent and deep. The race came originally from Saone-et-Loire, and is now the chief breed of the central departments. The cross with Nivernaise—an offshoot of the Charolaise—forms the best French beast for butchers. The cows are but poor milkers.

Class II, section 2, comprised twenty entries of Limousine cattle, aged from three years ten months to six years, most of them being four and a half years old. The color was always yellow, from a fawn white to a red wheaten-dun. The weights were generally close to M. Parry's first-prize beast weighing 19 cwt. 16 lbs. at three years ten months. The whole class was a good one, and carried one supplementary prize and one honorable mention. Docility, aptitude for work, and facility for fattening, make this breed a favorite. The Department of Haute-Vienne is its chief home, and at this show the best animal came from Limoges. The other prize animals were from the Gironde and Charente departments. For yield and quality of meat the Limousine ranks high; the features of a good animal being a light head, with white open horns, pink eyelids and muzzle, well-set back, rounded sides, short fleshy limbs, with white points that give a look of breed and fashion. A Limousine is usually less bulky than a Charolaise. The cows are fair milkers.

Class II, section 3, included the Garonnaise breed, and thirteen animals represented it. The race is improving, and was reckoned in advance of the Limousine cattle, supplying one of the heaviest beasts in the show, No. 113 weighing 22 cwt. 3 qrs. 6 lbs., and gaining third prize. Gironde and Lot-et-Garonne furnished the best specimens. The first prize weighed 1 ton 28 lbs. Garonnaise cattle are said to be the bulkiest in the sub-Pyrenean basin, and form two groups of the great bovine Gallic family—that of the valley and that of the hills. The latter are smaller, but more capable of work, than those of the valley. They have a very long body, flat sides, and confined chest, short buttock

and bony frame, with tail badly set. The head is long and heavy, with white horns and pale red eyelids. The coat is of an even dun or wheaten-yellow color. The oxen have colossal strength and work patiently, fattening easily. The females are handsomer than the bulls, but poor as milch cows.

Class II, section 4, had eight entries, all being of an even and rich grey color. Their weights were 905, 894, 933, 936, 881, 937 kilogrammes, or about 17 cwt. 3 qrs. each. The ages were from three years four months to five years. The first prize went to M. Chambaudet, of Meilhan, Lot-et-Garonne. Most of the exhibits came from the Gironde. The shape of the prize beast was typical of the breed which is reckoned perfect, with deep chest well let down, rounded flank, the body almost a complete cylinder, the line of back straight, the haunch broad, square, and well placed, heavy rump, sometimes bossy, horns often faulty, on a short head, with broad open forehead. For shape, the cows are especially handsome, but are only poor milkers. Temper in the bulls makes them generally dangerous. We have no breeds in England to parallel the Bazadaise. A group reminds one of a silver-grey Jersey herd, grown big and wild.

Class II, section 5, had but five entries; yet these were specimens of perhaps the most special breed in France, the bullocks often standing 6 inches taller than our biggest Shorthorns. In color they are deep mahogany red, with white often under the belly. M. Gustav Valtau, who took many prizes, carried the first in this class with a four years ten months animal, weighing 20 cwt. 2 qrs. 10 lbs. This breed is improving; they are good workers as well as meat-producers. The mountains of Auvergne were the cradle of the race, of which the head is short and strong, the forehead broad and covered with curly hair, the horns smooth, twisted, and turned outwards. The body is long and cylindrical, mounted on tall legs, the head and shoulders are strong, the dewlap thick and prominent, the rump short, with tail attached high up. On the Limagne plains the body is shorter, squarer, and lower on the ground, the coat often chestnut and white, the head sometimes white; yet the Salers breed is one of the most fixed character in France.

Class II, section 6, was comprised of seven entries, for the breeds Parthenaise, Choletaise, and Nantaise; but the specimens shown were all of the Parthenaise group. These were scarcely equal to expectation, yet their weights were fairly good; the first-prize animal, five years old, weighed 19 cwt., 8lbs., and the second prize turned a ton. The Parthenaise family includes Vendéenne, Nantaise, and Mancelle breeds, which occupy several departments—the Deux-Sèvres, Loire-Inférieure, Charente-Inférieure, &c. The breed is regarded as pure by some, and as a mixed race by others—crosses between Bernoise, Fribourgeoise, and Swiss cattle. The animals have one fixed characteristic, that of black external mucous membranes, surrounded by a badger-grey circle. The shape of all the groups is that of the old French breed, which is remarkable for good milking qualities, good fattening qualities, and good working powers. Handsome, well-directed, brilliantly black horns, a graceful, well-proportioned body, and good disposition, belong to a true Parthenaise, one of the best milch cows in France.

Class II, section 7, included several breeds, as follows: Flamande, Normande, Mancelle, Femeline, Bourbonnaise, Comptoise, Bearnaise, Basquaise, Aubrac, Mezenc, Brétonne, Tarine, &c. Only ten entries represented the above races, and the first prizes awarded were to a four years and two months old Bourbonnais, a yellow dun, of which the weight was not given. In this class was the exhibit of the Viscount Arthur de Chezelles, which had been fed on ensilage, and was the heaviest beast of the class, weighing 21 cwt. 3 qrs. 6 lbs., age five years two months and ten days. A Bourbonnaise took second prize and third prize, whilst the Norman entries only got honorably mentioned. In the subclass a handsome mottled-dun Basquais took first honors. The four entries of Bretonne class were good, and of the type well-known in England.

Of the Flemish breed, the great merit is their milking qualities, and the chief breeding districts are in the Pas de Calais and Aisne departments. The cows are large, straight-backed, with a large rump and well-hung tail, color a reddish brown, deepening toward the head; some have a few white marks. The sides are wanting in roundness. Of course the cows are too valuable to send to a fat-stock show, and the males are killed early for veal, except such as are saved for breeding. Manche and Calvados are the cradle of the fine Norman breed, wich is subdivided into Cotentine, Bressine, and Augeronne families. The breed is large and handsome, of great diversity of color and shape, but usually dappled, and often of the brindled-brown seen in our Longhorns. The quality of the meat makes the oxen valued in Paris, and specimens of this breed have been, it is stated, fattened to over 30 cwt. The cows are remarkable for their abundant and rich milk. The famous Isigny butter comes from the Bressine breed, and that of Gournay from various Norman families. The Livarot cheese, that obtained the prize of honor this year, is, like Camembert, Neufchatel, &c., made from the milk of Normans.

The Femeline cattle, of which there were no entries at the show, are of the Comptois type, and are raised in the Doubs and Saone departments. The coats are wheaten-yellow, the head slender, with small horns close to the eyes, the neck slim, the chest

long, the hind quarters broad, the legs short and fine, the skin supple and delicate, the root of the tail prominent. The cows are good milkers, the bulls vicious when old, the oxen good workers, and fatten easily. The first prize Bourbonnais came from M. Bellard, of Cours-les-Barres, Cher, and most of the entries were closely of the Charolaise type, but of a red-dun color. The breed is a favorite one with the butchers, and is well distributed in several departments across central France.

The Béarnaise, Basquaise, and Urt breeds are of the same family, and have the character of being good workers and producing excellent meat. The coat varies from deep red to light yellow color, the varieties showing the breed and district. The bull has a specially-developed horn, and is an animal of noted courage. The breed is from the Pyrenees, near Saint Jean de Luz, but stock for fattening are sent to the Landes, and so are often called "Landais" cattle in the Bordeaux market, where they are highly esteemed.

The mountains of Aubrae, the mountains of Mezene, give names to their breeds, which, feeding on fine herbage, have finely-flavored meat. The Aubrae is of a silver-gray or fawn color, with large horns, black at the points. The whole animal is compact and handsome, and the breed is a good one for working, fatting, or milk. The Mezene has a saddle back, enormous bones, massive head, and large front-projecting horns. The breed has a good constitution, and pays well for rearing and keeping.

There remain for reference the grand open and large class of cross-breeds, of the cow class, the groups of cattle, the small exhibition of young bulls, and the sheep and pig classes, which may be deferred until next week.

INVICTA.

P. S.—I have just heard the sale price of M. Signoret's champion prize was 4,000 francs (£160), bought for Magazins du Louvre. The fellow-champion made but 2,000 francs. M. Chaminade's champion pig sold for 1,000 francs.

"We are not accustomed to over-fatten meat in France," writes one of the leading French journals; and the same paper further declares that most of the animals sent to exhibitions pass the line that separates the best meat, as an article of food, from the too gross animals which carry off the prizes. Moreover, breeders, in preparing stock for exhibition, disregard economy in their production, which is better studied when ordinary butchers' animals are sent to market. "We are not Laplanders nor Esquimaux, to require such masses of fat as do the inhabitants of the Polar regions," indignantly exclaims the patriotic Frenchman, and next learnedly quotes the data of Messrs. Lawes and Gilbert, that ordinary beasts have only 19 per cent. of fat, whilst a fat prize ox has 30.1 of the same oily constituent—records of a very fat Shorthorn cow showing 6 inches to 10 inches of fat under the skin! However, as before observed, the fattest bullock in the Paris Show was a good way behind the champions of Norwich, Birmingham, and Smithfield, a finely ripened animal being a great rarity in the palace of industry. Last Tuesday week, certainly, the "Mardi Gras of Paris did not have any available fat ox to rival those of former days, even if carnival revels still had been in fashion.

To walk with the catalogue—and so continue my narrative of last week—the visitor to the Paris Show came to—

Class II, section 9, for pure foreign breeds, in which there were but four entries, all Shorthorns. And here—whilst in England there is a controversy about white cattle—the first prize may be recorded as falling to the forty months old white Shorthorn of M. Deplanche, the weight being 17 cwt. 3 qrs. 20 lbs. The second prize, for a white and roan, was taken by M. Nadaud, which weighed 44 lbs. more than the first-prize animal, although four months younger. The other two entries in this class were alike red and unsuccessful.

Class II, section 9, was the field of combat—an open class to all comers that were cross-breeds. The collection was a really fine one of forty-three entries, and to which no fewer than seven prizes and three honorable mentions were awarded. I put in a tabular form the list:

Prize.	Breed.	Color.	Owner.
First	Durham-Manceau	White and red	M. Arnaud.
Second	Durham-cross	White and red	M. Bouillé.
Third	Durham-Manceau*	White gray	M. Deren-Legrand.
Fourth	Durham-Charolais	Dun	M. Mativon.
Fifth	Durham-cross	Yellow	M. Brignon.
Sixth	Durham-Manceau	White and red	M. Nadaud.
Seventh	Durham-cross	Brindled	Count Brieg.

*Heaviest beast in show, weighing 22 cwt. 1 qr. 23 lbs.

The three honorably-mentioned animals were Durham-Charolais, Durham-Manceau, and Durham-Charolais. The Prince de Wagram had a white Durham-Ayrshire, and there were competitors in Limousin-Charolais, Garonnais-Bazadais, Lorrain, and other varieties, all left behind, whilst the Shorthorn blood was in the van.

French politeness, that bids us give "place aux dames" in the salon, does not extend priority in the showyard to cows, which now patiently follow, and form into—

Class III, section 1, for animals born before May 1, 1879, and being pure or crossed French blood. This class was a good one of twenty-four entries, the ages running up 7½ years. It is enough to say the prizes fell to—first, a white Charolaise-Nivernaise; second, a light dun Limousine; third, a white Nivernaise-Charolaise; and fourth, to a white Charolaise. The red Flemish and Norman brindled-red animals failed to attract attention.

Section 2 was more cosmopolitan, and invited pure and cross-bred cows; and here again first, second, third, fourth, and fifth prizes had Shorthorn blood, two of which were pure white Shorthorns. An eight-year-old Swiss cow and a yellow Limousine-Swiss were competitors; but then the winning animals were exhibited by such experts as MM. Mativon, Tiersonnier, Nadaud, Langlade, and Larzat, the Strattons of France.

The good-group system that is in favor across the Channel now brought before us twenty-eight beasts, in lots of four each:

Class IV, bullocks born since January 1, 1879. It was in this class that M. Gustave Valtau took first prize and the championship with his four Durham-Manceau cattle, a remarkably even and well-finished lot, well-built, square-set, and with capital hind quarters. The cross of the Durham-Norman group was passed over. The third prize and lot honorably mentioned were also of the Durham-Manceau breed, but the second prize fell to four white Nivernais, and all the groups were heavy, good beasts.

The second section of Class IV was for older animals, born before January 1, 1879. Here were fifteen groups, sixty animals; and besides the four prizes, the class was good enough to carry a supplementary prize. First, red and white, Durham-Manceau; second, white, Charolais; third, yellow, Basquais; fourth, yellow, Limousine; extra prize, white, Nivernais. I continue to give color, in evidence that white in France seems favored by climate.

The groups of cows in Class IV had sixteen animals and four prizes, but only two were given—Durham-Limousine first, and pure Shorthorns second.

Class V was fat calves, most of which were of Norman breed, as out of the twenty-three entries there were but the exceptions of a Swiss calf and three Cotentin (the latter a sub-race of Norman). The three prizes together aged but five months twenty days, with a total weight of 1,202 cwt. and 2 lbs.

PORTRAITS OF CELEBRATED BRITISH PRIZE CATTLE.

[Inclosure O O O in report of Consul-General Merritt, of London; text and portraits being taken from English publications.]

A, Shorthorn cattle; B, Devon cattle; C, Suffolk cattle; D, Longhorn cattle; E, Hereford cattle; F, Sussex cattle; G, Ayrshire cattle; H, Jersey and Guernsey cattle; I, Welsh black cattle.

The portraits of each group immediately follow the text relating to the same.

A. SHORTHORN CATTLE.

Shorthorn Bull Duke of Underley.—We here present our readers with Mr. Williams's sketch of Lord Bective's Duke of Underley. The following descriptive paragraph relates rather to general family history than to this particular bull. The Duchess of Geneva Tenth came over to this country with the reputation of being one of the most beautiful Shorthorned cows in the United States. Nor did her merit end with herself. Her first calf in England was Duke of Underley, the subject of this portrait. He too satisfied the most fastidious breeders, whatever their preferences might be. He represents the Duchess family as America has made them, *i. e.* with a slight infusion of strange blood through Romeo, who entered, indirectly, into the pedigree of the sire of Duchess of Geneva Tenth. She was put to Duke of Tregunter Second, a Duchess bull, having the "Usurer" cross, which was added by Earle Ducie. Duke of Tregunter Second had proved himself, in Gloucestershire, to be a sire of remarkable merit; his daughters, especially, at Kingscote and Siddington, being very grand animals, with the best of middles and long hind quarters. It seemed but reasonable to expect that the coupling together Duchess of Geneva Tenth—an American success in breeding—with Duke of Tregunter Second, a well-proved English sire, would, to borrow a Yankeeism from Martin Chuzzlewit, "eventuate a spanker." The engraving is from a drawing in the preparation of which measurement and photography were both employed.

Shorthorn heifer Lady Violet.—These portraits (front and side views) represent Mrs. Pery's Shorthorn heifer, Lady Violet (calved December 19, 1876), to which was awarded the first prize in her class at the Royal Dublin Society's last spring show. Lady Violet is by Don Diego (33539)—dam Lady-love by The Earl (27623), g.-dam Lady Sarah by Best Hope (23413), &c. The side view is a good reproduction of a very successful photograph.

Shorthorn bull Anchor.—Lord Rathdonnell's bull Anchor (winner three years running at the Dublin Spring Show) was one of the sights at the Kilburn Show. It is good to have opportunities occasionally to compare the products of the sister kingdoms with our own. Clydesdale horses and Irish and Scotch Shorthorns are good tests by which to try English showyard favorites. Mr. Chaloner (the Irish judge), who bred Anchor, stepped on one side when the chief prize in this class was awarded. The other two judges gave the first place to Anchor, who, in addition to his personal successes, was shown in comparatively hard condition, an example worth copying. The engraving is, we think, a remarkably successful example of justice done by photography.

Shorthorn bull Telemachus.—Four or five groups of Shorthorns have, in the course of the last two seasons, made themselves conspicuous above their rivals for number and excellence. These are the Marquis of Exeter's Telemachus family, the Earl of Dunmore's Red Roses, Colonel Loyd-Lindsay's Burlesques, Mr. T. H. Miller's Ringlets, and Mr. W. H. Wodehouse's Countess groups. One and all of these are a sufficient answer to the oft-repeated assertion (which is, however, very limited truth) that fattened parents entail barrenness or degenerate offspring. It is one of the merits of the Shorthorn that it will bear forcing without breaking down. Among all the groups named the Burghley one must now be held to be entitled to the first place. Sea Gull and her offspring, all by Telemachus, are so curiously alike, and all of such a very striking type in the show ring, that she and they must be held to be the most remarkable family group in England. The members of the group seen at Kilburn were by no means all Sea Gull's produce by Telemachus.

Here we have a portrait of one of the winning four, all of whom are for color, size, and condition, entitled to rank separately as prizeworthy cattle.

Shorthorn cow Lady Carew Third.—In her old age Fanny, a Warlaby cow, went from Mr. Wilson, of Brawith, "for a song" to the Hon. Colonel Duncombe, who, bringing her to Waresley Park, had a heifer calf from her by Hero (a bull sharing Bates blood), which he called Heather Bell.

When Heather Bell was well-stricken in years she fell "to the nod" of the late Mr. Pawlett; who, hardly venturing to expect produce, put her to one of his Booth bulls—Prince James—and had a calf, so little expected that he named her Miracle. Miracle, in her turn, bred freely; and her blood-red daughter Lady Jane, by the "Bracelet" bull Baron Killerby, was one of the cheapest lots at the famous Beeston sale in 1872.

Mr. St. John Ackers took Lady Jane to Gloucestershire, and she has proved that the virtue of regular and long-continued fecundity is hers, as well as her granddam's; for she has produced in succession three light roan heifers, each of which in turn received the name of Lady Carew, by the white Warlaby-bred bull, County Member, of the Christon tribe. All the Ladies Carews have been successfully exhibited, and all have had the same characteristics. All have been somewhat small heifers; with very fine bone and on very short legs. All have had the silkiest of hair, and a long even carcase, somewhat unduly weighted with flesh and fat at both ends. Lady Carew third (of whom we give a portrait) has a bosom which is wonderful to see. She inherits the blood o almost all the leading strains, though her sire is purest Warlaby.

Shorthorn dairy cow Victoria.—The portrait represents Mr. Fred. Harvey's first prize cow in the dairy class at Kilburn, named Victoria—type of a capital dairy cow; well formed as the mother, whether of meat-carrying steers or milk-producing heifers. Here, too, we have an example of successful representation by means of photography.

Shorthorn dairy cow Maiden.—The profile portrait represents Mr. W. Stratton's white dairy cow, Maiden, which took the first prize in the class of unpedigreed dairy cattle at the dairy show in the Agricultural Hall. She is, we understand, out of a good ordinary Shorthorn dairy cow, by the same sire as got Nectarine Bud, which was a noted prize-taker at both the Royal Agricultural Society's and the Birmingham shows.

Shorthorn heifers Stanwick Rose and Gaiety Sixth.—The portraits represent two very pretty Shorthorn heifers exhibited at the Perth show of the Highland Agricultural Society, by Mr. James Whyte, of Aldbro, Darlington, which took the first prize in the classes for yearling and a two-year-old Shorthorn heifers respectively. The older heifer is Stanwick Rose, by Lord Godolphin (36065), dam Moss Rose by Baron Killerby (27949). The yearling is Gaiety Sixth, by Ben Brace (30524), dam Gaiety by Merry Monarch (22344).

Shorthorn cow April Rose.—The favorite old "Mossrose" cow April Rose, having ceased to breed, has gone to the butcher. This cow was remarkable, not only for her personal merits, which were very great, but for the excellence of her progeny. Calved in April, 1862, she brought her first calf in August, 1864, and her thirteenth and last in 1876. Among the best of her produce were the following: A white steer, calved in 1865, that gave remarkable promise for Christmas honors; but he went wrong before the shows, and when slaughtered, a large stone was found in his stomach. Twin steers in 1867. One of these won the prizes for best Shorthorn and for best ox or steer in any of the classes at Birmingham; also the Champion cup and gold medal for the best beast in the yard at Smithfield, 1871; and further distinguished himself in the hands of Mr. Morrison in 1872. Flower Girl, by James First (24202), won first prize as calf at Manchester "Royal;" and among her many other prizes was first as breeding cow at the Bath and West of England at Dorchester. Passion Flower, own sister to the above, was never shown, but was the *ne plus ultra* of a Shorthorn. Village Rose, another own sister, won the first prize as calf at the Yorkshire; first at the Bath and West of England as a yearling; and second at Cardiff "Royal," where she was sold to Mr. Cochrane, Canada, for 300 guineas. Since these, April Rose has produced two heifers and three bulls, one of the former, March Rose, by Protector (32221), is still in the herd; two of the bulls died young, but Expectation (38264) is being largely used in the Duffryn herd.

Shorthorn bull Duke of Howl John.—This white bull is Mr. John Vicker's Duke of Howl John, a not euphoniously named, yet a remarkable animal. He was six years two months three weeks two days old when his photograph was taken. How well he has held together during that long fattening time, his portrait tells. He represents the mixture of Bates blood (in a small indirect infusion) with that of the elder Mr. J. Booth. The earliest named dams came from Killerby, the latest sire from Mr. Barnes, of Westland, Meath. The bull himself has attained great distinction. Almost every recent English show of "first" class has seen those victorious which were placed below him at Carlisle; yet Duke of Howl John, by his selection by a quite competent bench was preferred to all of them.

It is not to be expected that such a success should be at once accepted as deserved by everybody. Yet it would puzzle the critics who challenge the decision to find more fault in the Duke of Howl John as a breeding animal (about whom the ugliest point is his name) than can be pointed out in any of his defeated rivals. His rough shoulder points are his most conspicuous defects; and this is probably owing to his sire, White Duke, who inherited the blood of Grand Duke Third. Yet the presence of these shoulders, would seem to imply great masculine vigor. At all events, unsightly as they are, the

animals which have this conformation have generally extra strong constitutions. Duke of Howl John has besides, through his grandsire, the blood of the Townley Richard Cœur de Lion, whose use by Mr. Eastwood was believed, by the late Mr. Pawlett, to have been the means of invigorating that branch of the Bracelet tribe which came into his possession. It furnished the bull Baron Killerby, to which the Beeston herd owed so much. It undoubtedly would be preferable to obtain a bull for the showyard without rough shoulders, and also for use at home. But rough shoulders should be accepted with something more than toleration when the animal which has them brings into a herd fecundity and length of days. The photograph successfully represents a very massive, well-made animal.

Shorthorn cow Baroness Oxford Third.—We give the likenesses of two of the most fashionably-bred specimens of Mr. T. Holford's herd. The cow (whose head is fairly represented) is Baroness Oxford Third, a granddaughter, in direct line, of the celebrated old Holker cow, Lady Oxford Fifth. Baroness Oxford Third is by the famous Kingscote sire, Duke of Hilhurst.

Shorthorn bull Duke of Leinster.—The young bull is Duke of Leinster. He is a grandson (by his sire) of the cow of which we have just been speaking; but, on his dam side, he is of the Airdrie family of Mr. T. Bates's "Duchess" tribe. His dam, Duchess of Airdrie Seventh, was bred by Mr. Albert Crane, Kansas, United States of America.

Shorthorn cow Matchless Fifth.—The portrait represents Mr. E. C. Tisdall's cow Matchless Fifth, shown at the Agricultural Hall at the recent dairy show, which took the champion prize as the best dairy cow in the yard. We heartily join in the congratulations which Mr. Tisdall has received from his many friends upon his success. It is a happy and most welcome fortune that one who has shown so much public spirit in the thankless and laborious work of establishing and guiding a great national institution such as the dairy association must become, should himself reap the highest honor awarded by the society's judges at its annual exhibition. Of the cow herself the best account is given by her well-known breeder, Mr. Hobbs, of Maisey Hampton, Gloucestershire: "The first prize cow, Matchless Fifth, at the London Dairy Show in the shorthorn class being bred by me, and in my possession until within two months, enables me to certify as to her good milking qualities. When newly calved she has produced twenty quarts per day, and yields a good supply through the whole of the season. The judges appear to have looked on her square, well-shaped udder as indicative of a good milk producer, although her last calf was dropped on November 1, 1880. She is by a bull bred by Mr. Edward Bowly of his Gazelle tribe." This is one of Mr. Stacey's photographs.

Shorthorn cow Generous.—The following note is from the Herdsman: The cow Generous, in the Ratton Park herd, near Eastbourne, was bought for 300 guineas in September, 1878, direct from Mr. J. B. Booth. She is of the same tribe as Mr. St. John Acker's cow Queen of the Georgians. We give an engraving of Generous, from her photograph, with her last year's heifer calf, Georgia Regia. She is by King of Trumps (31512), calved March 12, 1879.

Shorthorn bull calf Acropolis.—Shorthorn bull calves at York were represented in a class of many entries; but the stalls showed several gaps. Oddly enough, all the winners of prizes were outsiders. Mr. R. Stratton's capital young bull Acropolis (one of the younger) was put first. We have here a capital portrait.

Shorthorn dairy cows (Mr. Birdsey's and Mr. Taylor's).—These portraits represent two of the late dairy show winners, in one of the best classes in the hall, *i. e.*, No. 3, Shorthorns for which no pedigree is asked. In many country districts cattle of this stamp are reared, generally by pedigree bulls from cows which were similarly bred, but of whose breeding no authentic record has been preserved. These really are milking Shorthorns in proper condition to exhibit at a dairy show. The darker roan is Beauty, No. 22 in the catalogue, and the property of Mr. Thomas Birdsey, of Southcote Farm, Leighton, Beds. She was awarded the highest place. The lighter colored animal was put second by the judges, but was preferred by not a few of the lookers-on, and her yield of milk proved rather the larger in amount. She, too, is called Beauty, and was shown as No. 35, and is the property of Mr. George Taylor, of Stanton Priors, near Bristol. Although not extraordinary, these are good specimens of the milking Shorthorns, such as exist on hundreds of farms, where this most serviceable variety is cultivated.

Shorthorn cow Red Cherry.—The portrait represents the second prize cow, Red Cherry the property of Mr. Joseph Phillips, in the class of dairy cows at Reading. It has evidently been taken when the udder was empty, and thus it does not compare so favorably as it might with portraits given elsewhere of cows in the same class which received no award. The judges, however, have no doubt been guided, as in our opinion they always ought to be, by the other elements besides milk which go to make up the character of a cow for the dairy. Mr. Phillips's large and massive Shorthorn cow, though it does not promise milk produce either so large or so good as that of the Guern-

sey, or that of the Ayrshire, is likely to be on the whole a better animal for the ordinary cheese or butter dairy in a fairly fertile district. Its superior capability of converting food into beef, after it has done its work as a milk producer, makes it the best of the three as a dairy cow in the opinion of the society's judges.

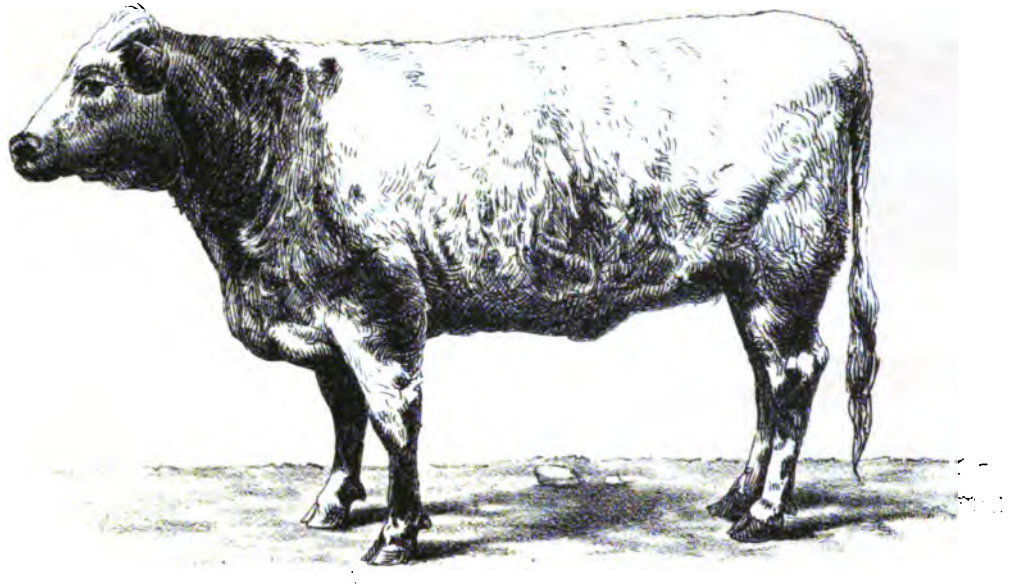
Shorthorn cow Innocence Second of Naseby.—Innocence Second of Naseby was calved June 20, 1880. Sire, Earl of Geneva (33794); dam, Innocence, by Telemachus Third (32650).

Shorthorn bull Sir Simeon.—The celebrated bull Sir Simeon (42,412) whose portrait is given in page 89, was bred by Mr. Aylmer, and calved January 16, 1878. He is by Mr. Booth's Sir Wilfrid from Foreign Beauty, which was bred by Mr. W. Torr, and purchased by Mr. Aylmer, when a handsome calf, at the great Aylesby sale, 1875, for 500 guineas. Hitherto she has produced only bulls, which have been sold for large sums; Mr. John Peel purchased one of them for his herd at Knowlmere. Sir Simeon is a deep rich red in color, of large scale and great substance, and walks like a thoroughbred animal. He has what those old judges who founded the breed considered a great attribute—a fine large masculine head, with a pair of strong, rather upstanding horns. His appearance indicates vigor and fine constitution; his ribs are round and deep, but his long hind quarters and full thighs are somewhat dwarfed by hips a little too prominent. Mr. Teasdale Hutchinson, of Catterick, whose career as a farmer, breeder, and exhibitor has rarely been equaled, offered 500 guineas for him when a yearling; but his superior merit and high lineage induced Mr. Aylmer to keep him at home for his own herd. It is to this bull that the Duke of Manchester's two best Oxford cows of Bates's blood, as well as other highly bred animals, have been sent for service. He was sold last autumn to Mr. W. Talbot Crosbie, for his extensive herd at Ardfert Abbey, Ireland, to which place the bull will be taken, early next spring, should disease regulations permit.

THE EARL OF BECTIVES SHORTHORN BULL
"DUKE OF UNDERLEY"

Julius Bien & Co. Lith.

SHORTHORN HEIFER "LADY VIOLET".

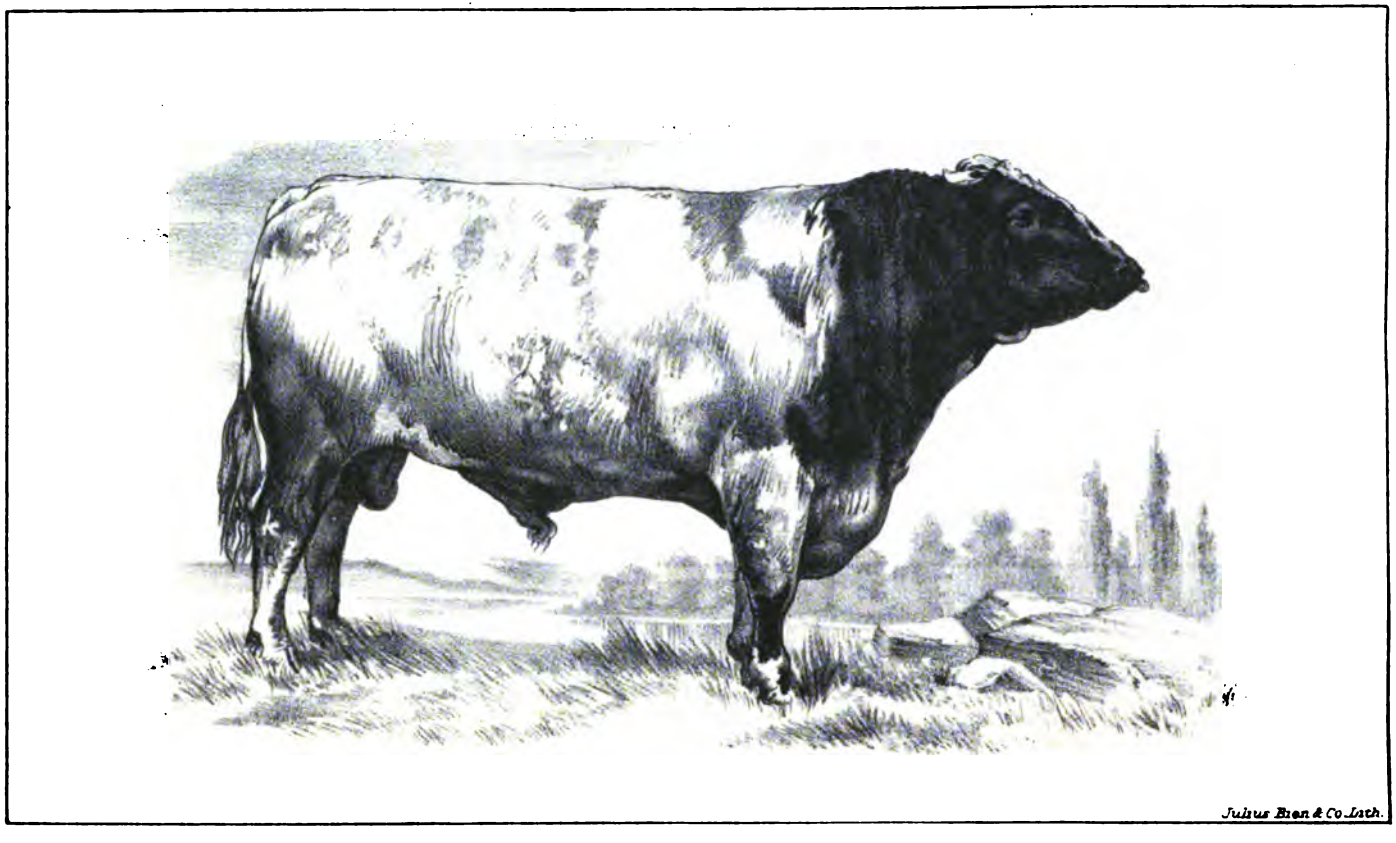


Julius Bien & Co. Lith

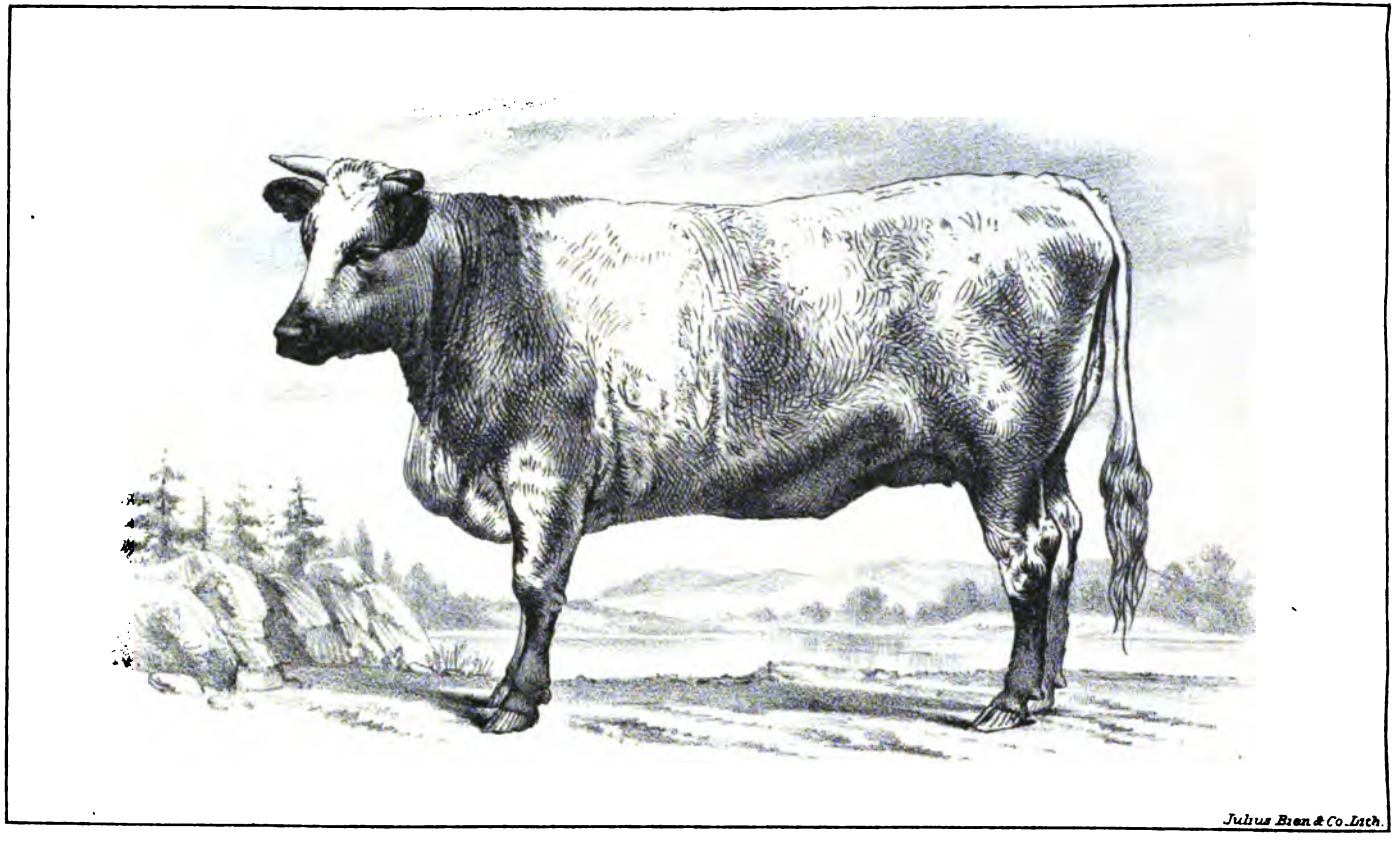
SHORTHORN HEIFER "LADY VIOLET"

Julius Beer & Co. Lith.

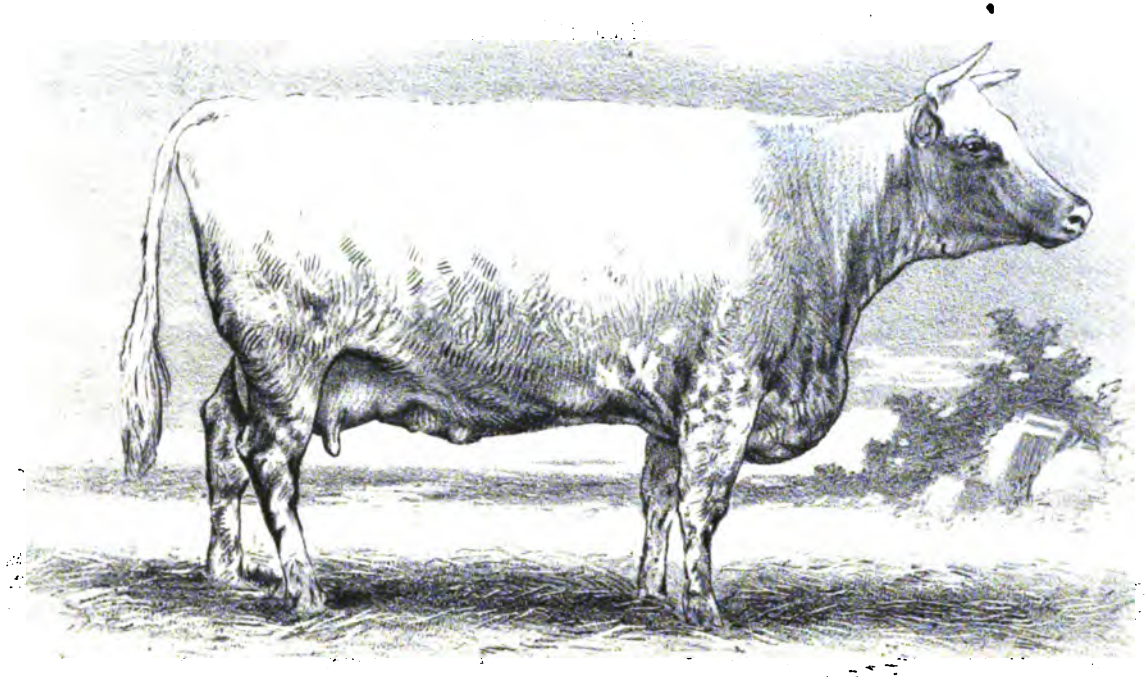
LORD RATHDONNELL'S SHORTHORN BULL "ANCHOR"



LORD EXETER'S SHORTHORN BULL "TELEMACHUS"

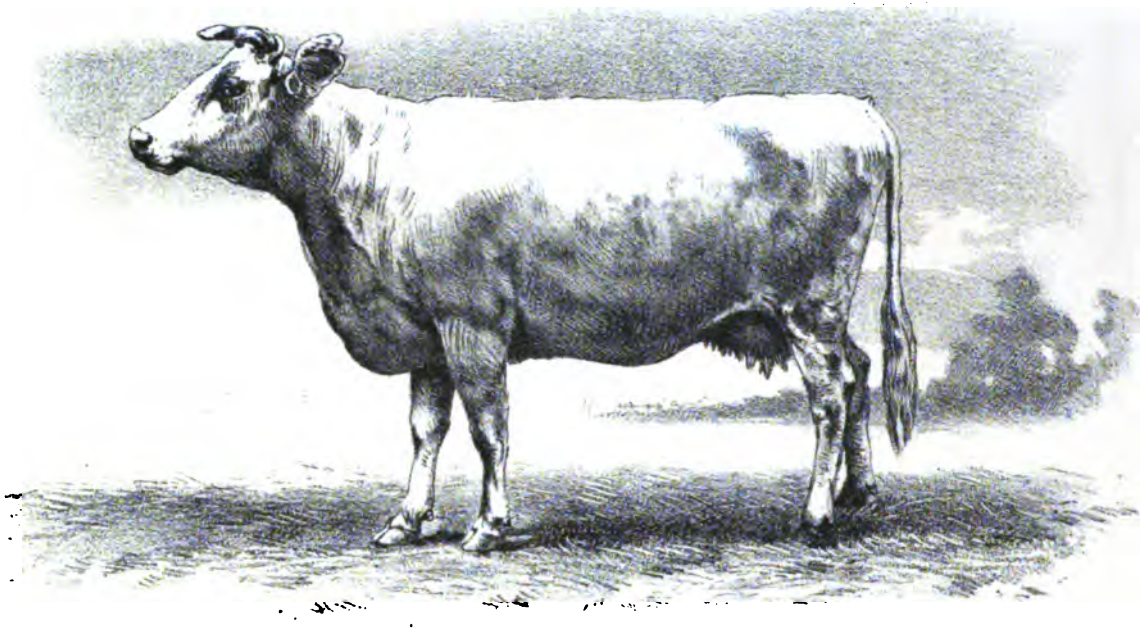


MR. ST JOHN ACHER'S SHORTHORN COW "LADY CAREW"

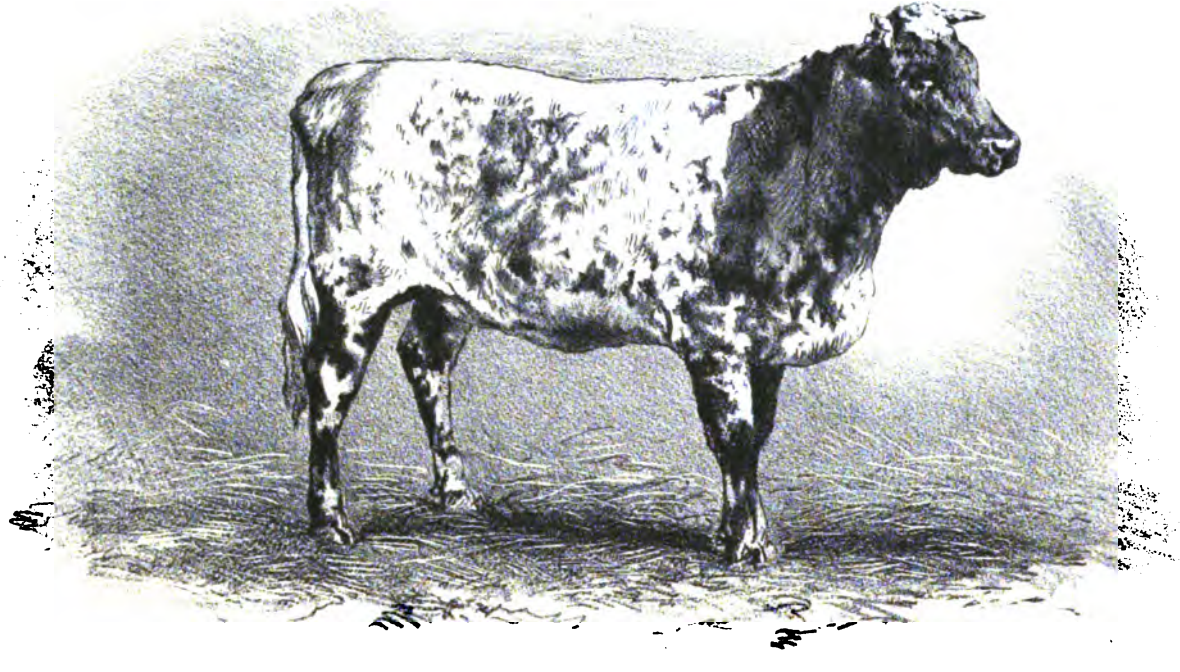


Julius Bien & Co. Lith.

MR F HARVEY'S SHORTHORN COW, "VICTORIA"

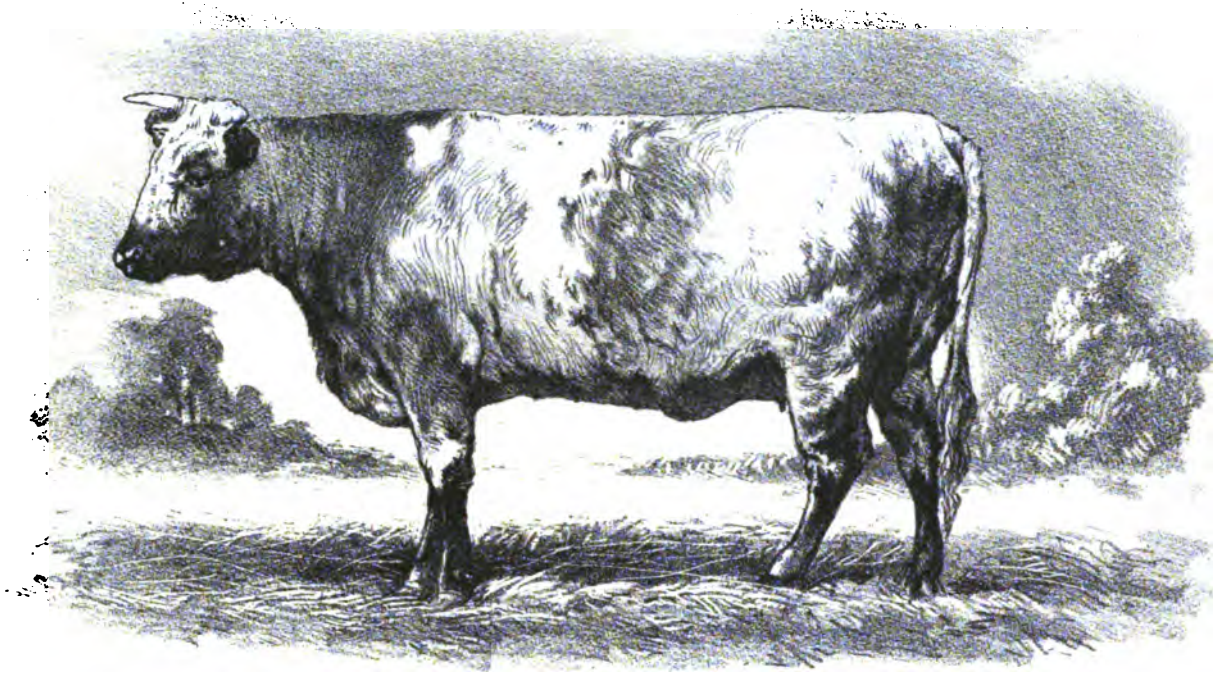


MR W STRATTON'S WHITE DAIRY COW, "MAIDEN".



Julius Bien & Co. Lith.

MR. JAMES WHYTE'S YEARLING SHORTHORN HEIFER
"GAIETY 6TH" 1ST AT PERTH

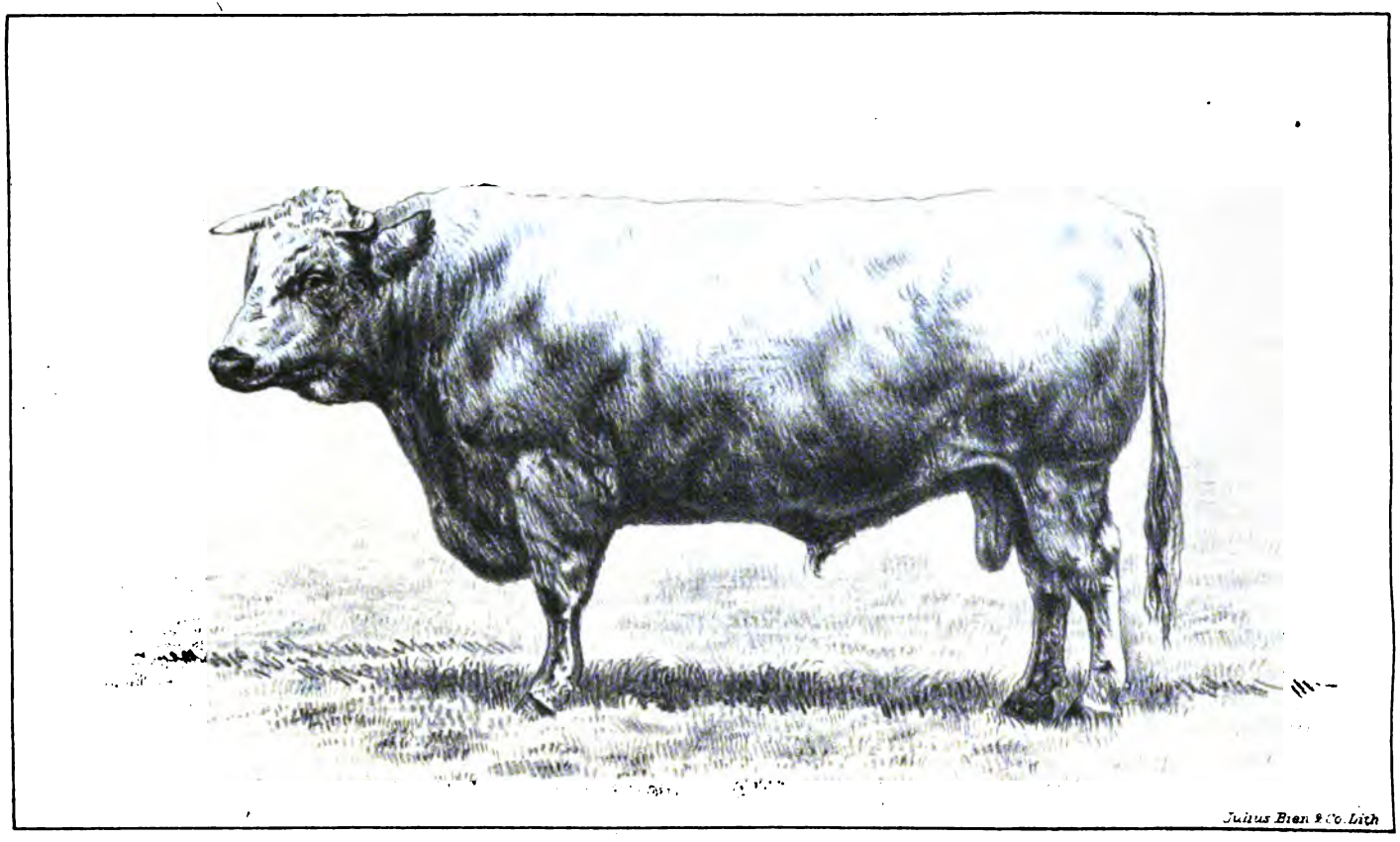


Julius Bien & Co. Lith.

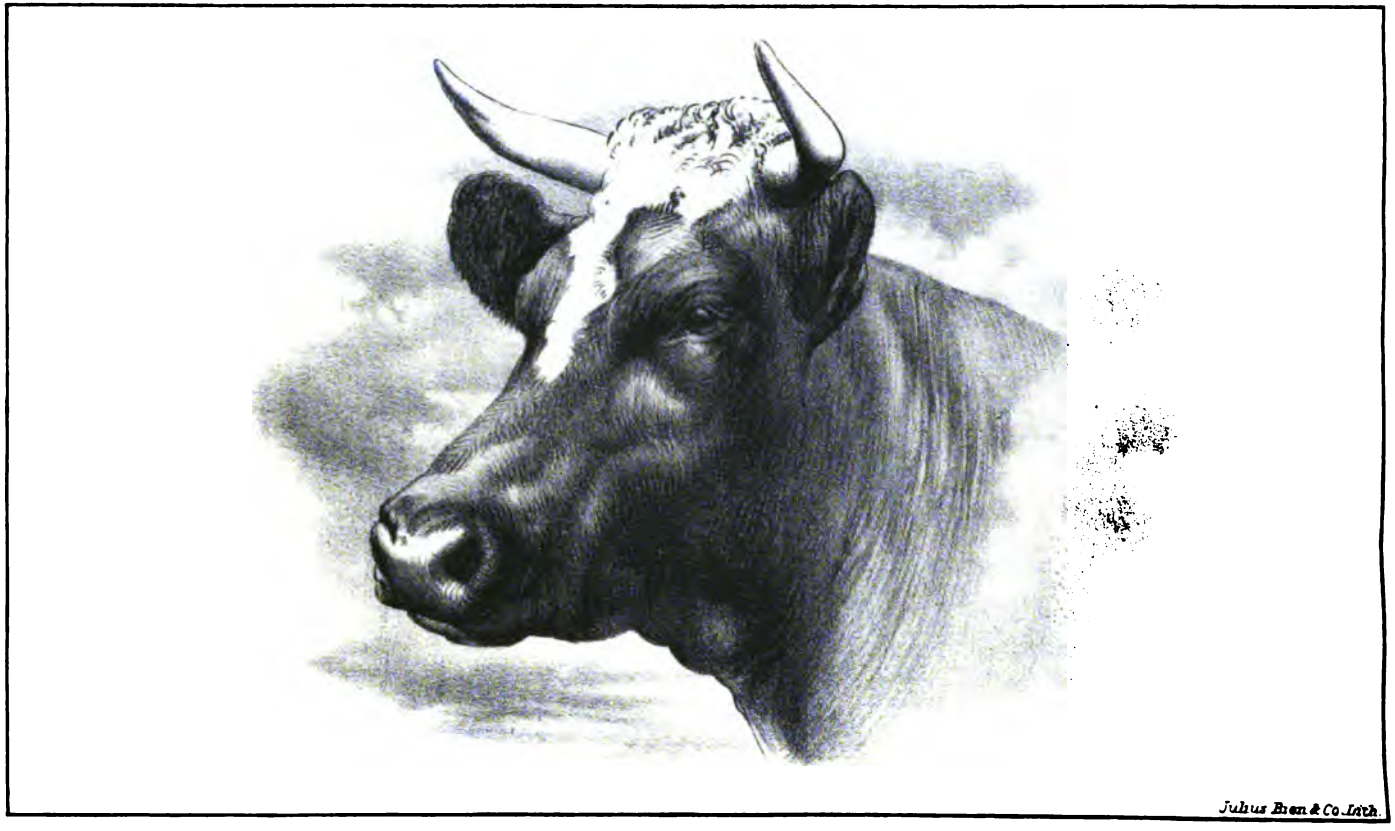
MR. JAMES WHYTE'S 2-YEAR-OLD SHORTHORN HEIFER,
"STANWICK ROSE".

Julius Bien & Co. Lith.

MR. STRATTON'S SHORTHORN COW "APRIL ROSE"



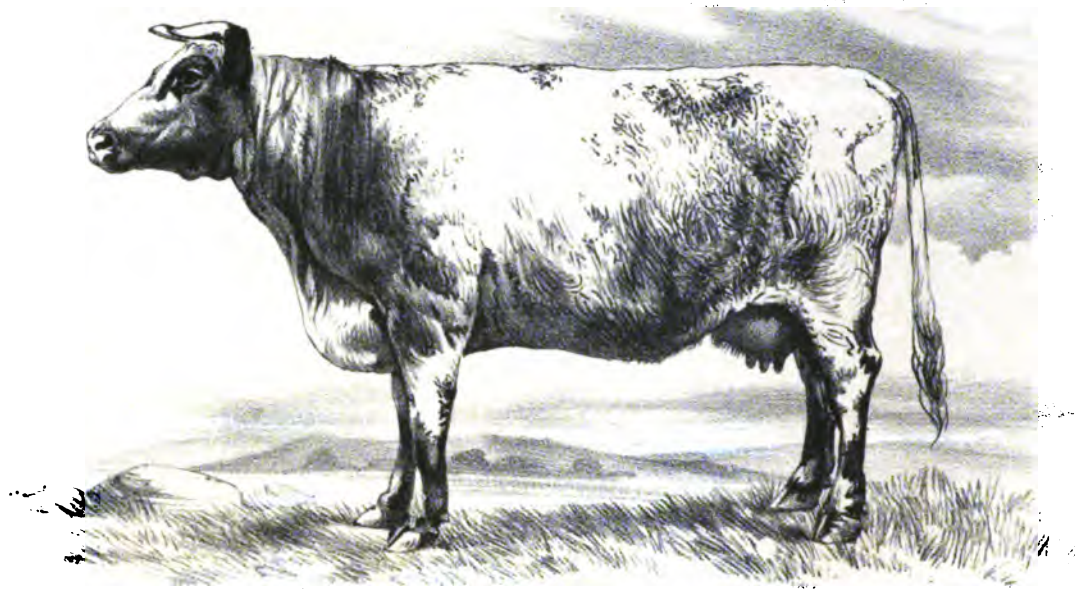
SHORTHORN BULL "DUKE OF HOWL JOHN"



HEAD OF SHORTHORN COW

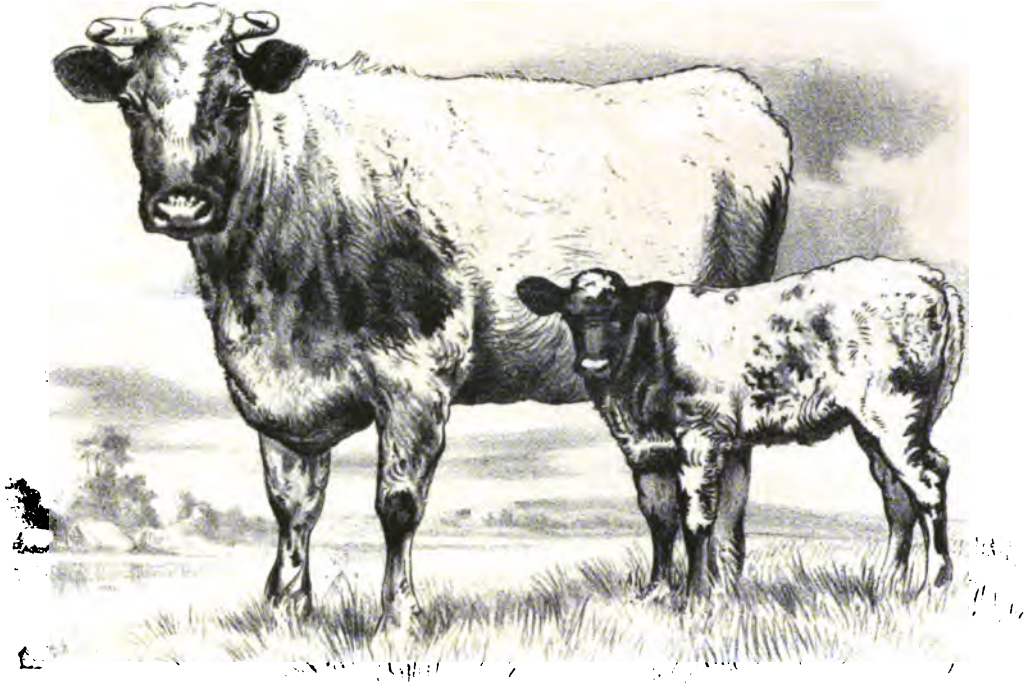
Julius Bien & Co. Lith

HEAD OF SHORTHORN BULL



Julius Bien & Co. Lith.

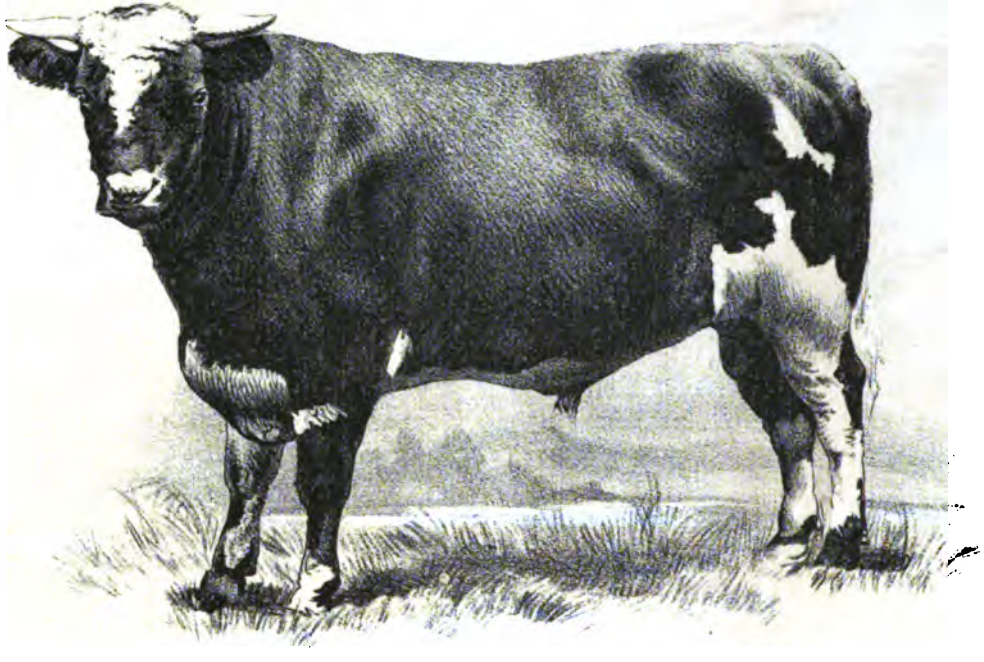
SHORTHORN COW "MATCHLESS"



Julius Bien & Co. Lith.

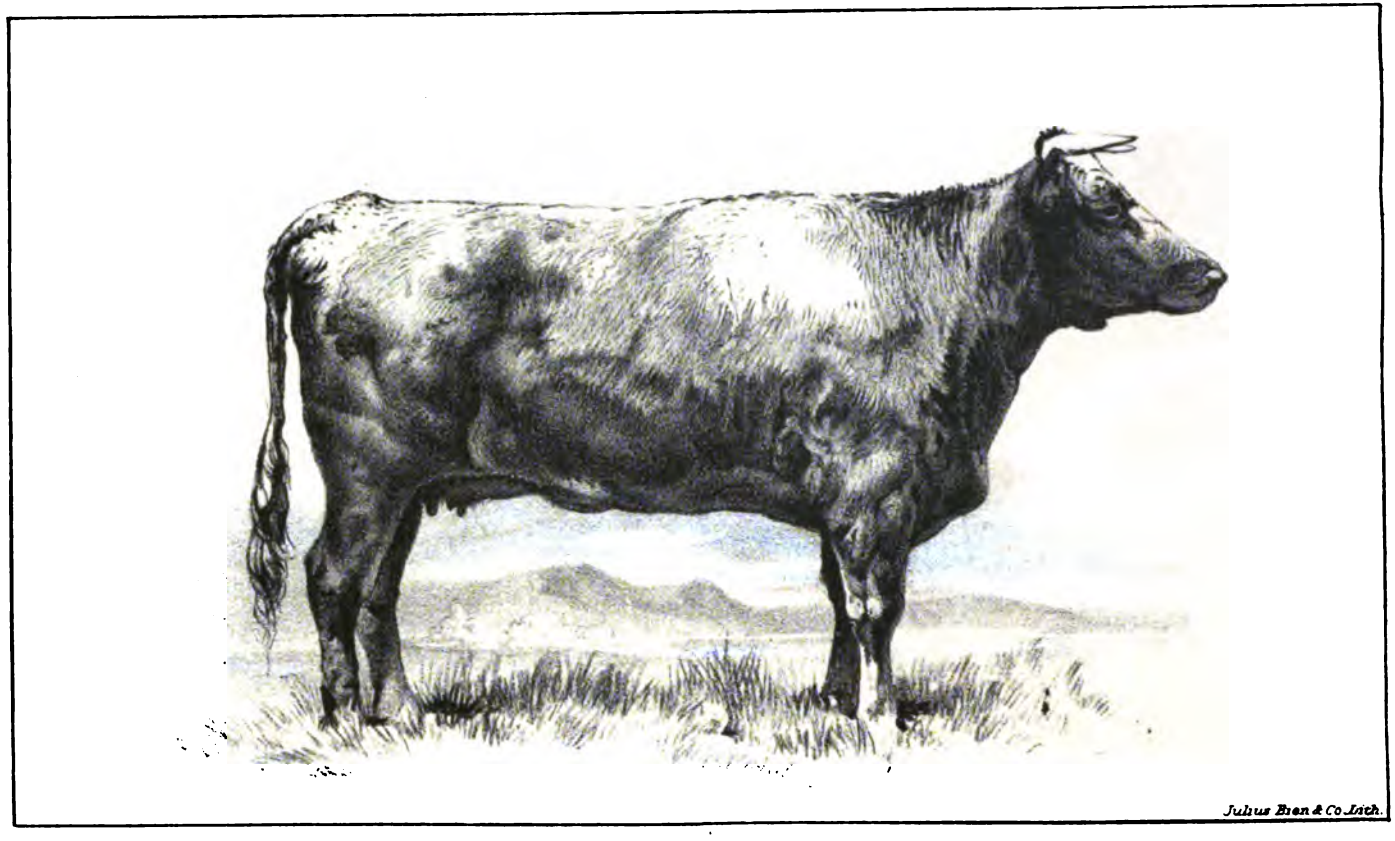
SHORTHORN COW "GENEROUS"

MR R STRATTON'S SHORTHORN
BULL CALF "ACROPOLIS"



Julius Bien & Co. Lith.

COL GUNTER'S SHORTHORN BULL "NINTH DUKE OF TREGUNTER"

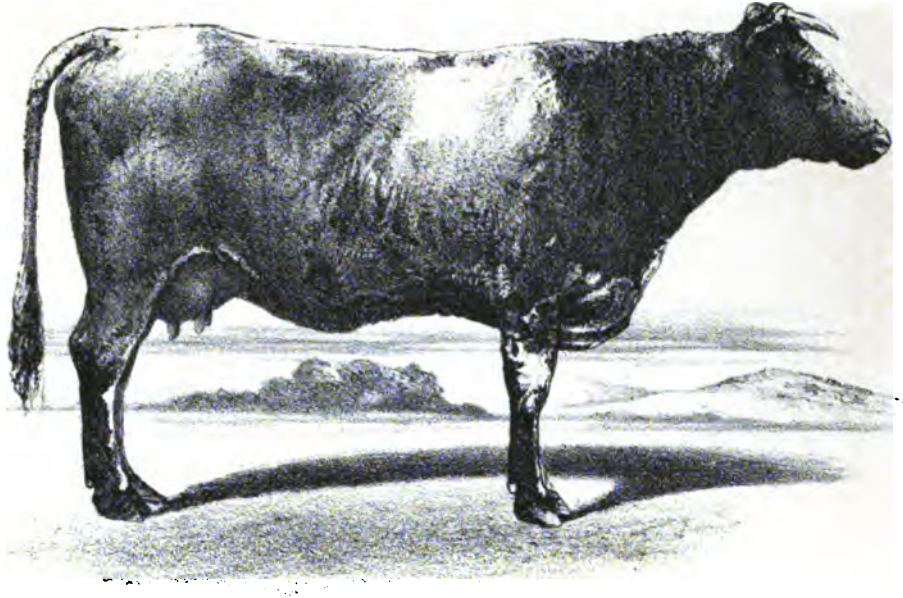


COL. GUNTER'S SHORTHORN COW "DUCHESS ONE HUNDRED AND NINETEENTH"

Julius Bien & Co. Lith.

MR. BIRDSEY'S SHORTHORN COW "HONESTY"

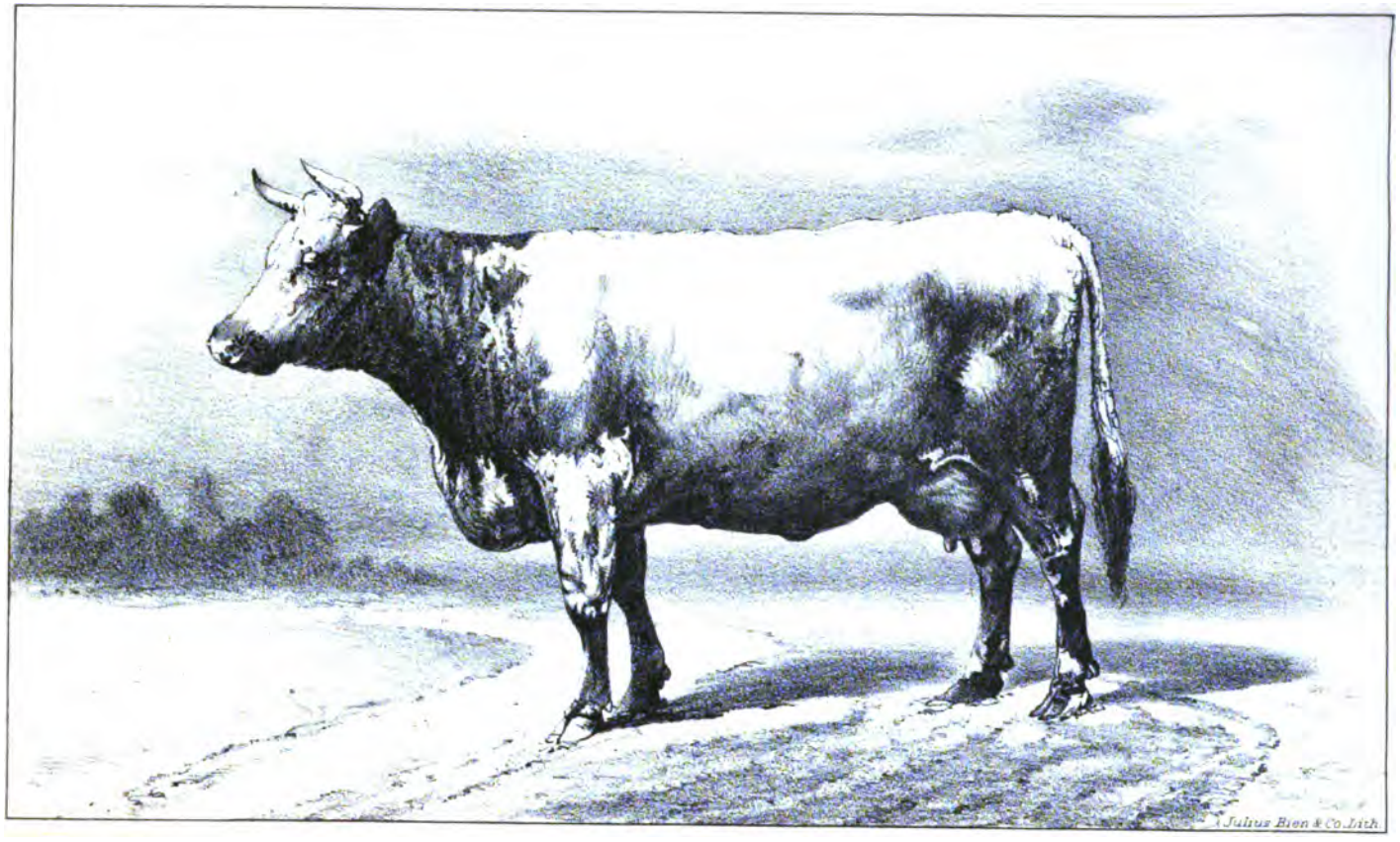
FIRST IN HER CLASS AT ISLINGTON.



Julius Bien & Co. Lith.

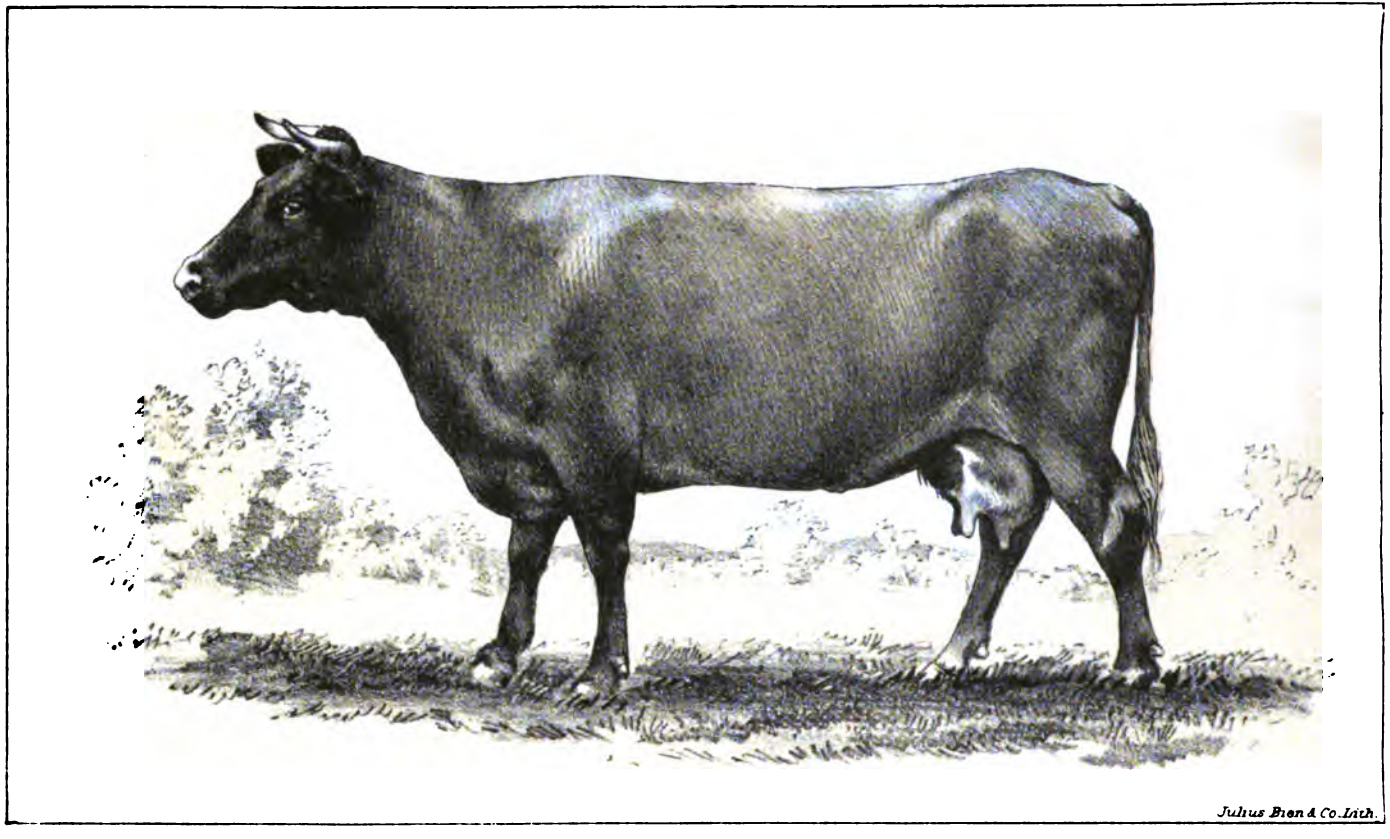
MR. BIRDSEY'S DAIRY COW

FIRST IN HER CLASS AT SLINGTON

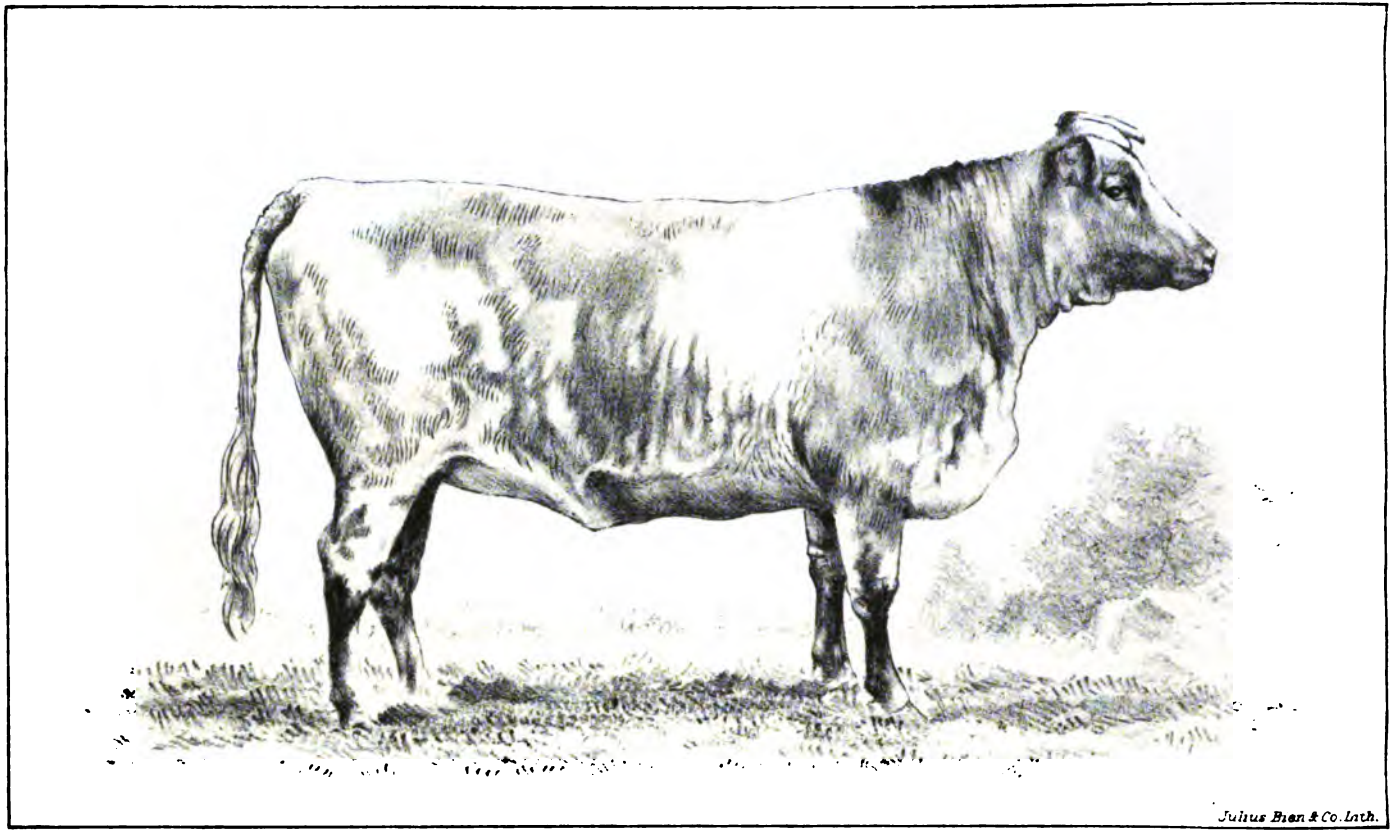


MR. TAYLOR'S DAIRY COW

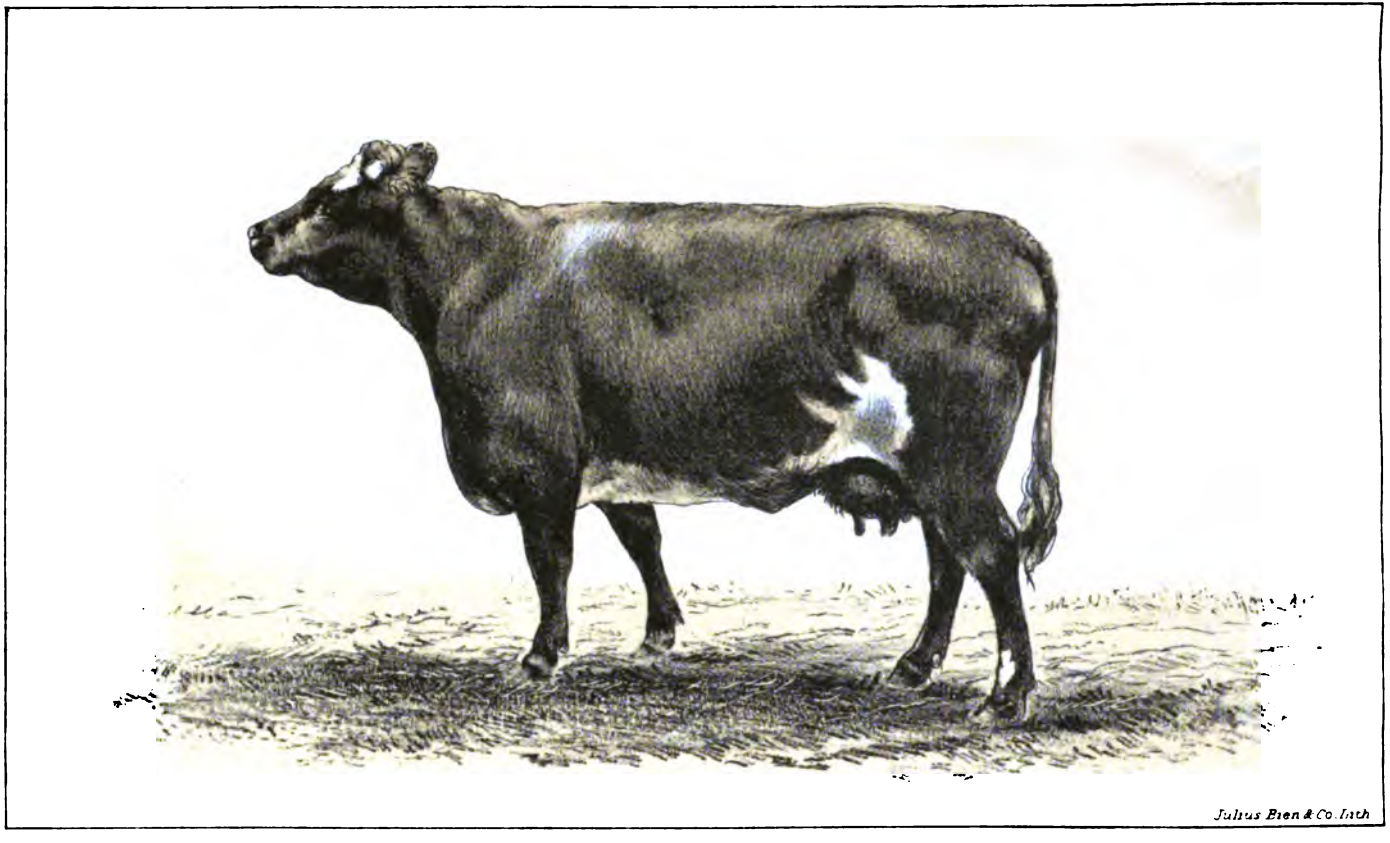
SECOND IN HER CLASS AT ISLINGTON



SHORTHORN COW "RED CHERRY"

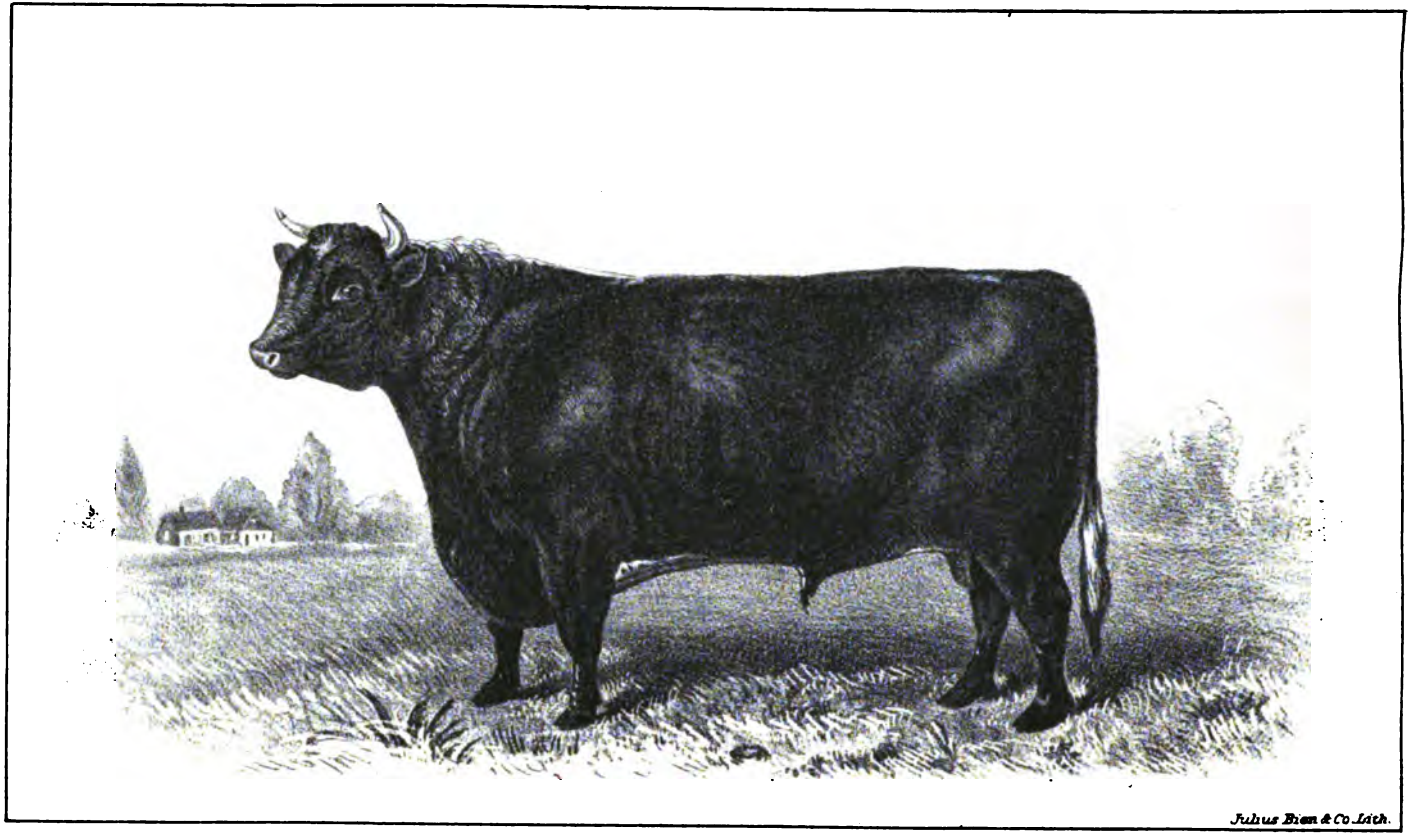


"INNOCENCE 2ND OF NASEBY"



Julius Bien & Co. lith.

"MAY DUCHESS FIFTEENTH"



Julius Bien & Co. Lith.

MR. HUGH AYLMER'S "SIR SIMEON"

PORTRAITS OF BRITISH PRIZE CATTLE—Continued.

B. DEVON CATTLE.

Devon cow Phlox.—The portrait represents Mr. Rolles Fryer's Devon Phlox and her calf. The calf is a charming little heifer by Mistletoe. Phlox won first prize, 1883, at the Devon County show, competing in the class of heifers a year older than herself; first at the Bath and West of England at Cardiff; first at the Royal Cornwall at Launceston; and third at the Royal of England at Reading.

C. SUFFOLK CATTLE.

Suffolk cow Wild Rose.—The portrait represents Wild Rose, a 10-year old Suffolk cow, the property of and bred by Mr. George Gooderham, Monewden, Wickham Market, Suffolk, calved April 10, 1874. Sire, The Claimant; dam, Rosy by Perfection; granddam, Beauty by Wander.

Produce: January 5, 1878, Wild Rose of Kilburn; April 9, 1879, Wild Robin; April 14, 1880, Wild Rover; April 29, 1881, Wild Rupes; March 10, 1882, Wild Rosy; March 7, 1883, Wild Ruth.

This cow has been shown three times for the milking test at the Suffolk Agricultural Association, and has gained one first and two second prizes against all breeds, and has never been beaten by a red polled for milking purposes. She gave at Woodbridge and Beccles 26 pints in twelve hours. At home she daily gives 54 pints for the first four months after calving; and as 20 pints of her milk make 1 pound of butter, this proves that she has made nearly 19 pounds per week for sixteen weeks. She is now (August) giving 40 pints per day, and makes 14 pounds of butter weekly. It is worth noticing that this proportion (*i. e.*, 1 pound of butter for 20 pints of milk), is exactly the same as that from Shorthorns (reported from the Journal of the Royal Agricultural Society of England, near Hull).

D. LONGHORN CATTLE.

Longhorn bull Prince Victor.—The portrait represents Prince Victor, a longhorned bull owned by Maj. Gen. Sir F. W. Fitzwygram, Bart., of Leigh Park, Havant, Hants; five years and three months old, bred by Mr. Shaw, Fradley Old Hall, Lichfield—by Earl of Upton 7th (76), dam Princess. This engraving is reproduced from a very admirable photograph taken in the Kilburn show-yard for the Mark Lane Express. Prince Victor took the first prize in his class at the meeting of the Royal Agricultural Society at Kilburn last year.

Longhorn cow Calké.—The portrait represents Mr. Richard Hall's longhorn cow, Calke, which took the first prize in her class—"cows in calf or in milk above three years old," at the Bristol show of the Royal Agricultural Society. The breed has distinct dairy aptitudes, and this cow in particular is evidently a good dairy cow. The photograph has done fair justice to the cow, and the engraver has copied it to accuracy.

E. HEREFORD CATTLE.

Hereford bull Thoughtful.—Here we have an uncommonly successful drawing of a good Hereford, given as representing a meat-making breed. The steers of the breed are quite as massive—quite, we think as good in rib and sirloin and rump, where the best beef grows, as any other breed, the Shorthorn included.

Mr. Taylor's bull did not take the first prize at the Kilburn show. In the class for bulls above three years old, the well-known prize-taker Grateful, bred by his exhibitor, Mr. Aaron Rogers, of the Rodd, Kington, Herefordshire, took first honors. Thoughtful was placed second to him; he is better behind, but not so good as Grateful in his fore flank.

Hereford heifer Leonora.—At the late Bristol show of the Royal Agricultural Society of England, Mrs. Edwards was prominent with her beautiful pair of heifers. There was no finer animal than Leonora there; none carrying and capable of carrying such a wealth of meat on legs so short. Fortunately for the country, old Winter de Cote left something more than a good name, and any young breeder need not feel disgraced to be near such stock as the half sisters, Beatrice and Leonora.

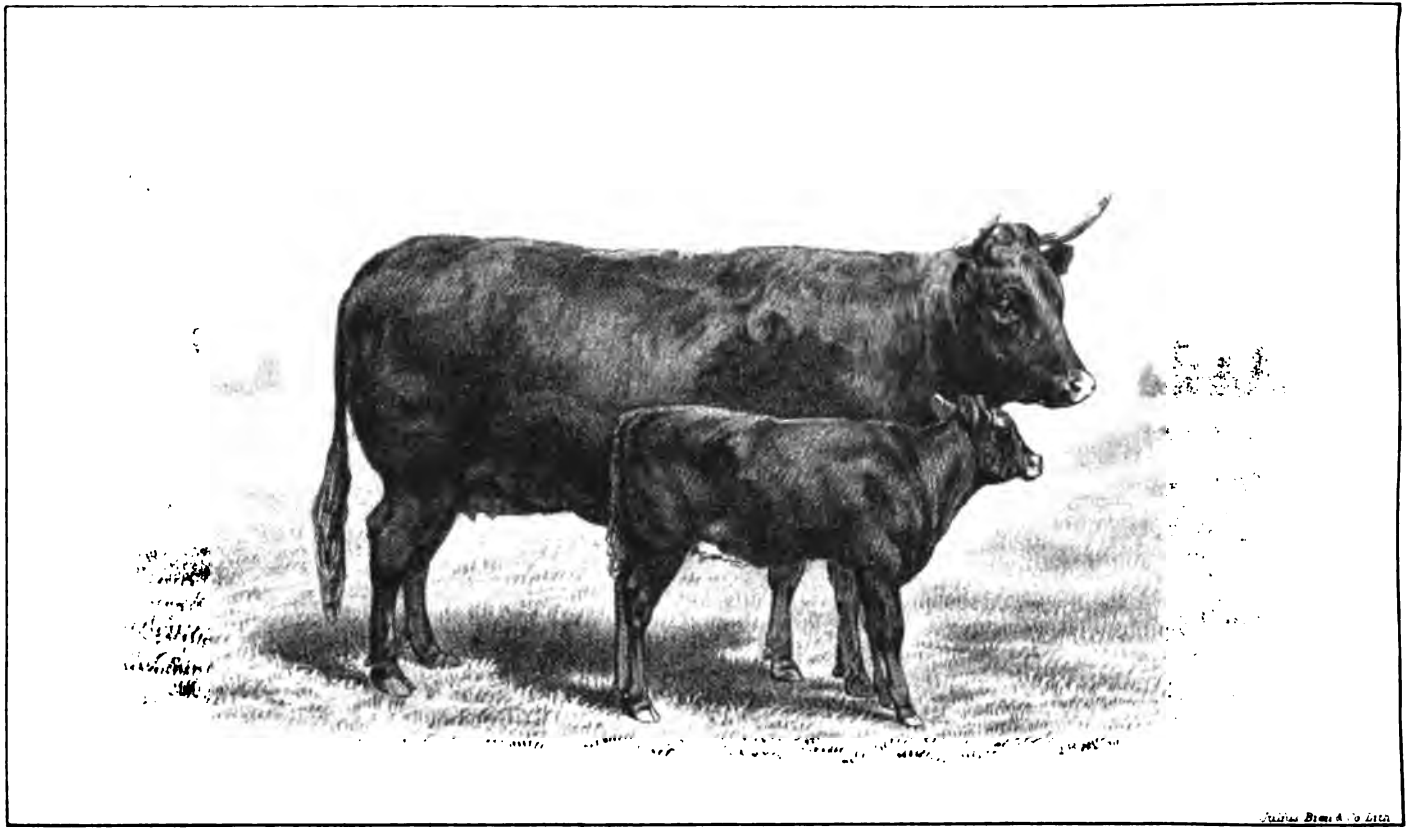
F. SUSSEX CATTLE.

Sussex heifers.—The Sussex is—like the Aberdeenshire Poll—the "coming animal" for farmers only in those districts where cattle-breeding is distinct from dairying. But it seems certain that it can add size and deep flesh to many herds, which are kept in remote places, under the natural conditions of having "to prog for oneself." With its somewhat thick (though supple) skin, hard hair, and great activity, it seems quite the animal for the bush, the backwoods, or the rough land now being laid down to grass because it cannot find a tenant. The portraits are capital representations of a most useful kind of grazing stock.

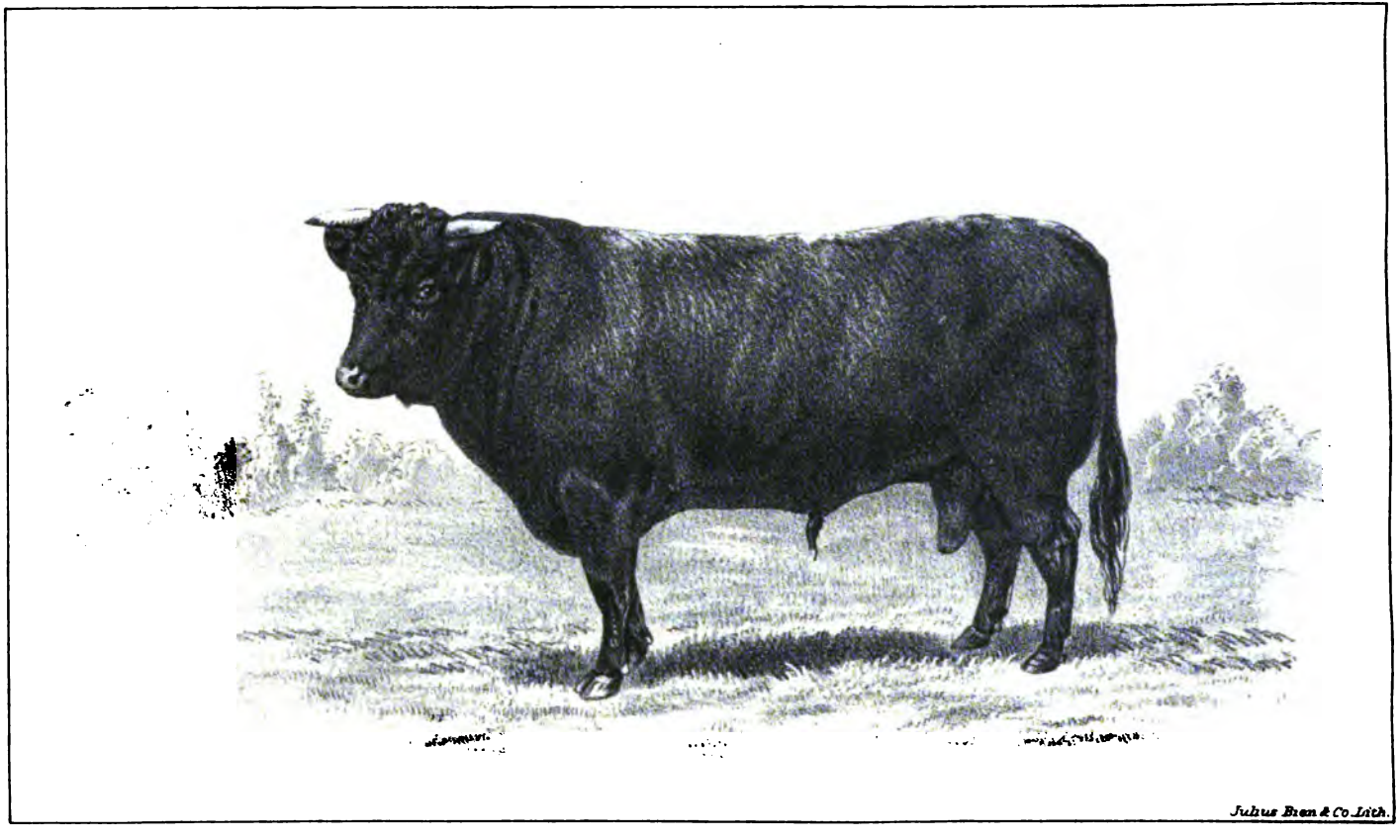
G. AYRSHIRE CATTLE.

Ayrshire cow Jane.—Mr. George Ferme's Jane was the first prize Ayrshire cow in class 5 at the Autumn Dairy Show at Islington. Jane is about 5 years old, breeder unknown. She is a capital specimen of the Ayrshire breed.

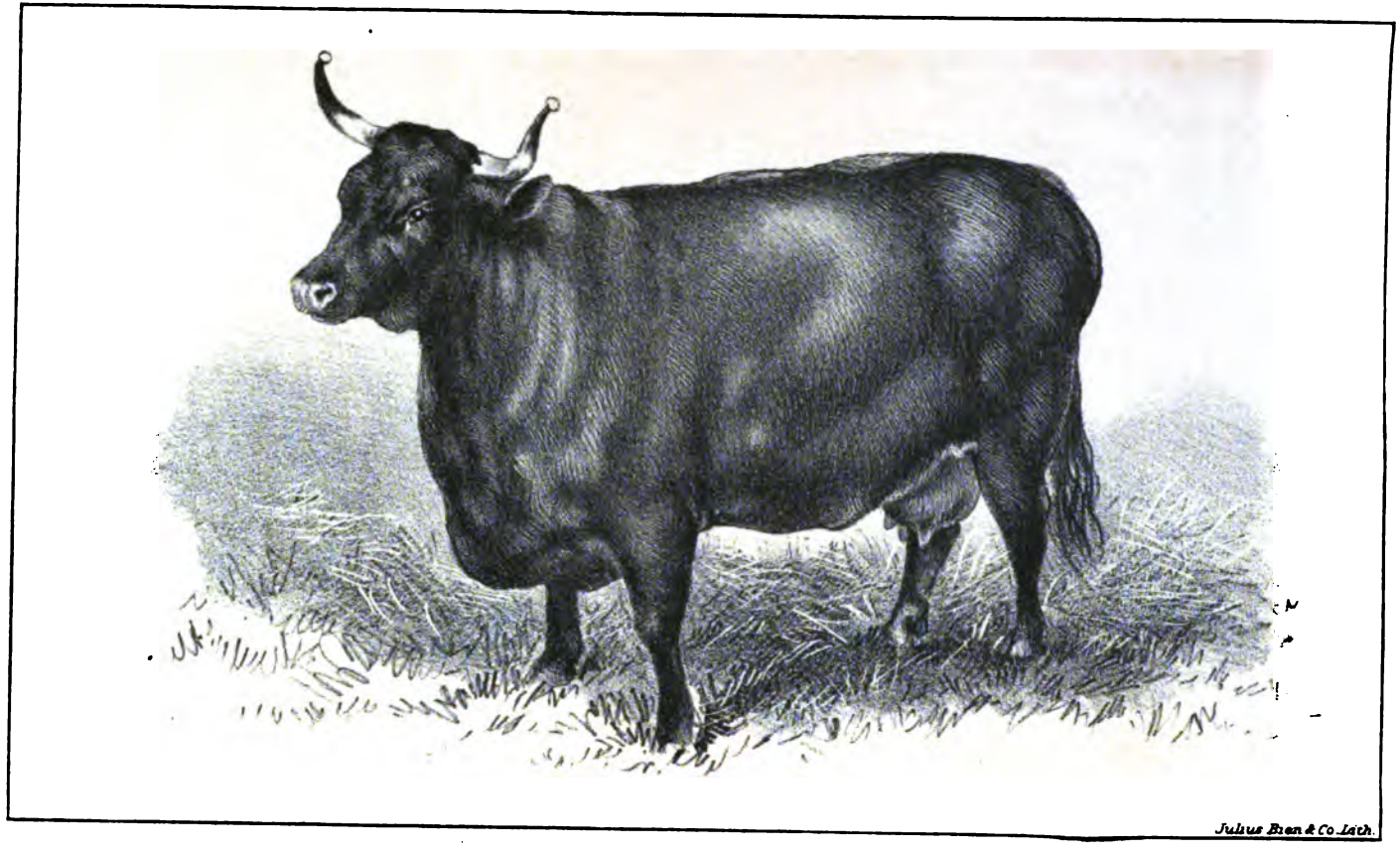
Ayrshire cow.—The portrait represents a capital dairy cow of the Ayrshire breed, and, as can be seen from the engraving, a good specimen of that admirable dairy breed; she yet remained undistinguished in the midst of a large class, not expressly of Ayrshire cattle, but of dairy cattle of any breed or cross-breed at the Reading Show, so good a representation did it give of the best dairy cattle in the country.



MR ROLLES FRYERS DEVON COW "PHLOX"



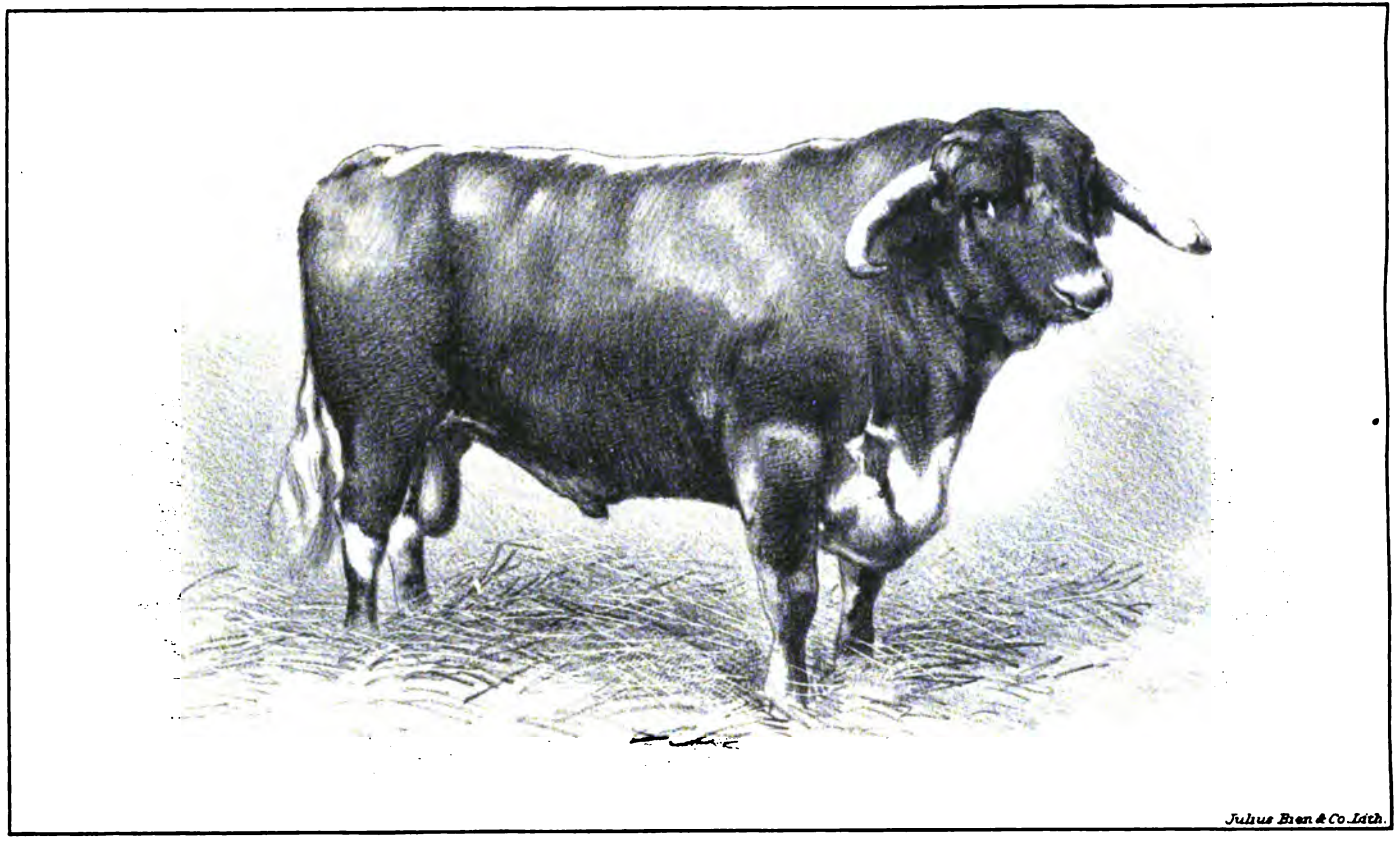
MR ROLLES FRYER'S DEVON BULL 'SWEET WILLIAM'



Julius Bien & Co. Lith.

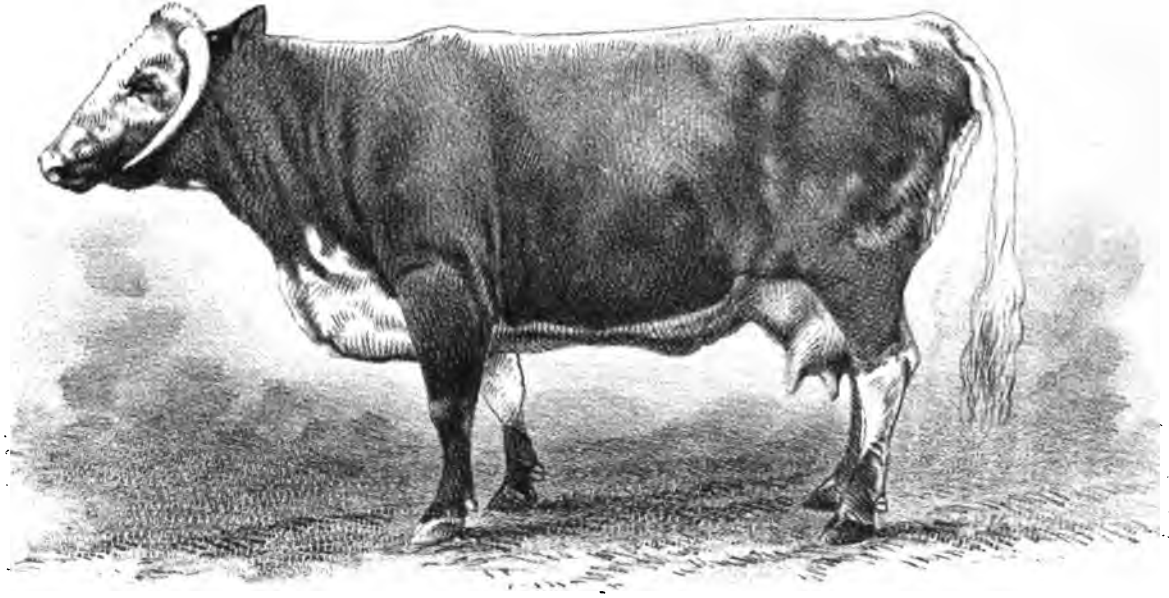
SIR W R WILLIAMS' DEVON COW 'TEMPTRESS 8TH'

MR. GOODERHAM'S SUFFOLK COW "WILD ROSE"



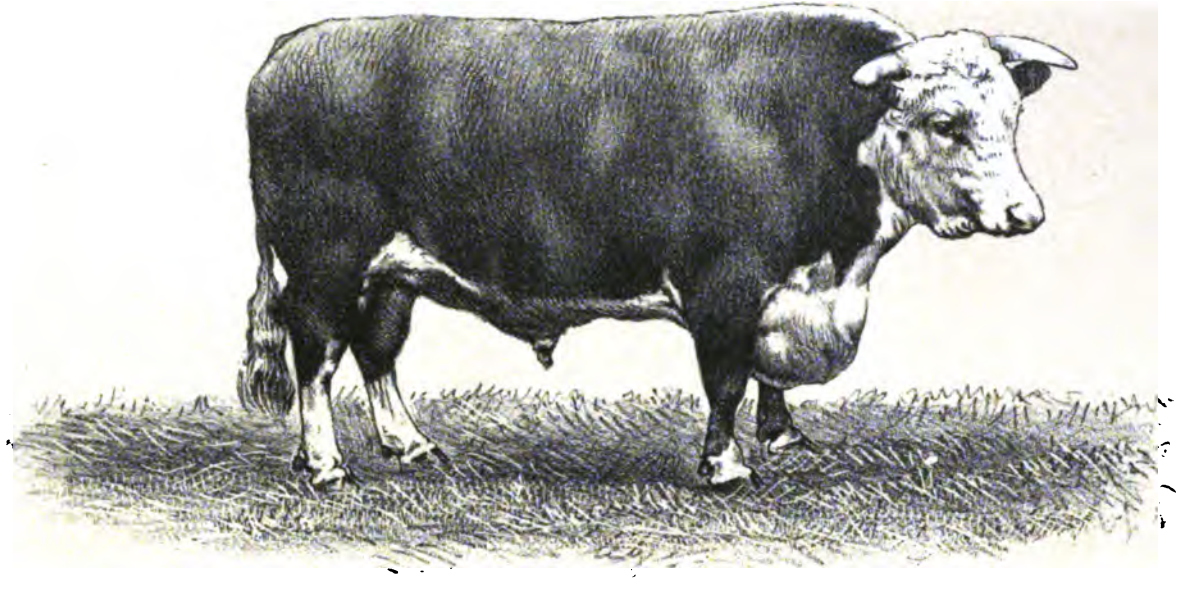
Julius Beer & Co. Lith.

LONGHORN BULL "PRINCE VICTOR".



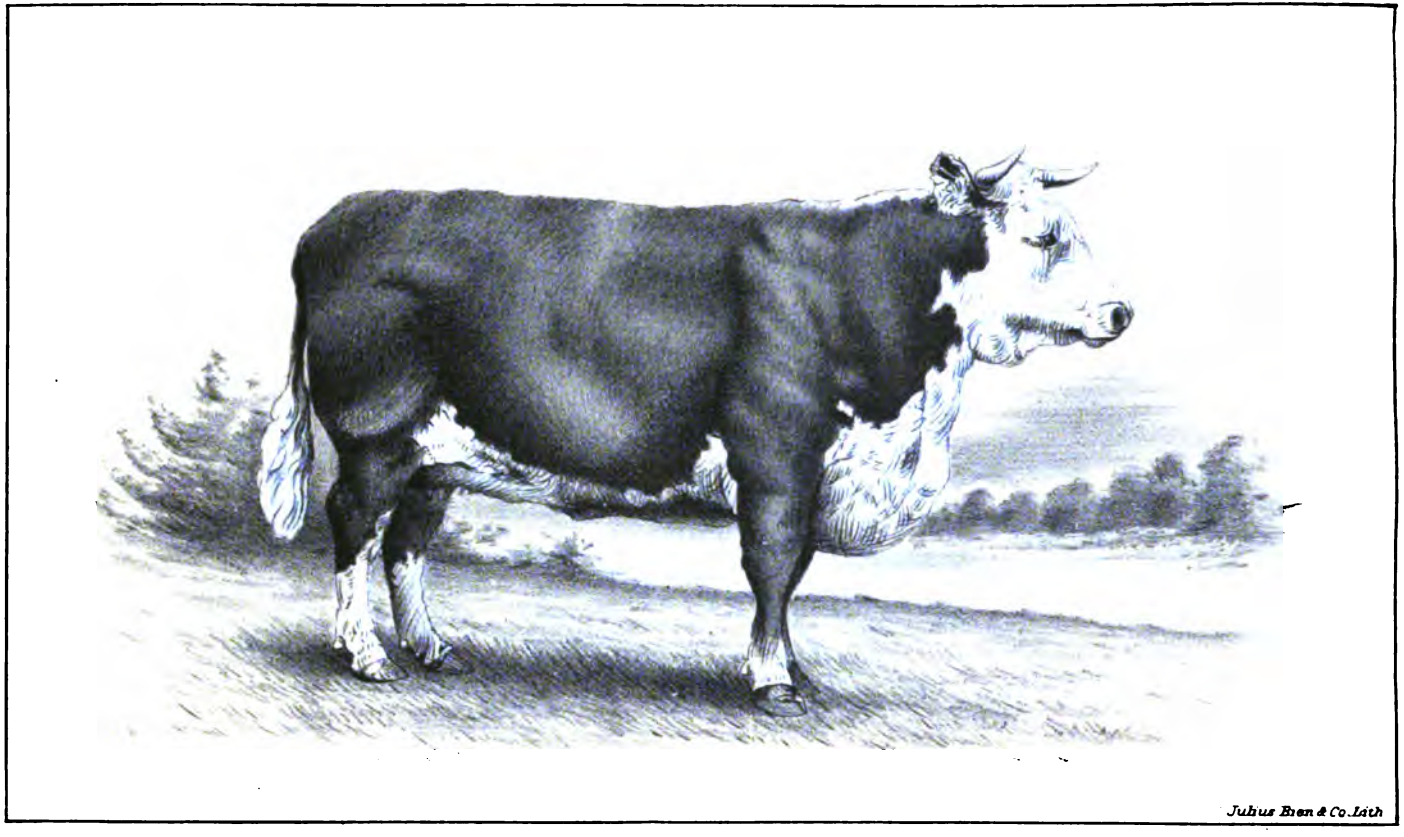
Julius Bien & Co. Lith.

LONGHORN COW "CALKE".

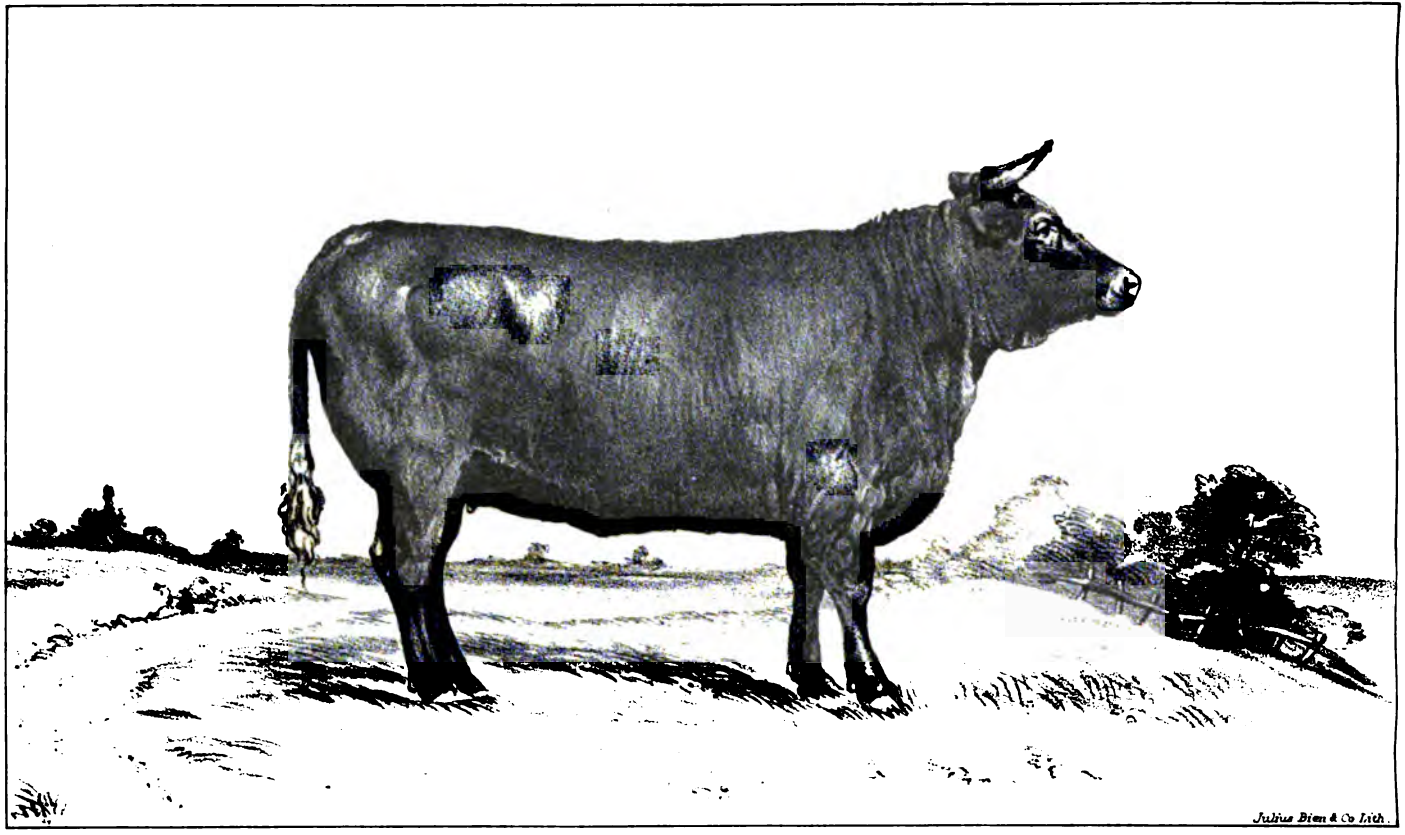


Julius Beer & Co. Lith.

MR TAYLOR'S HEREFORD BULL "THOUGHTFUL".

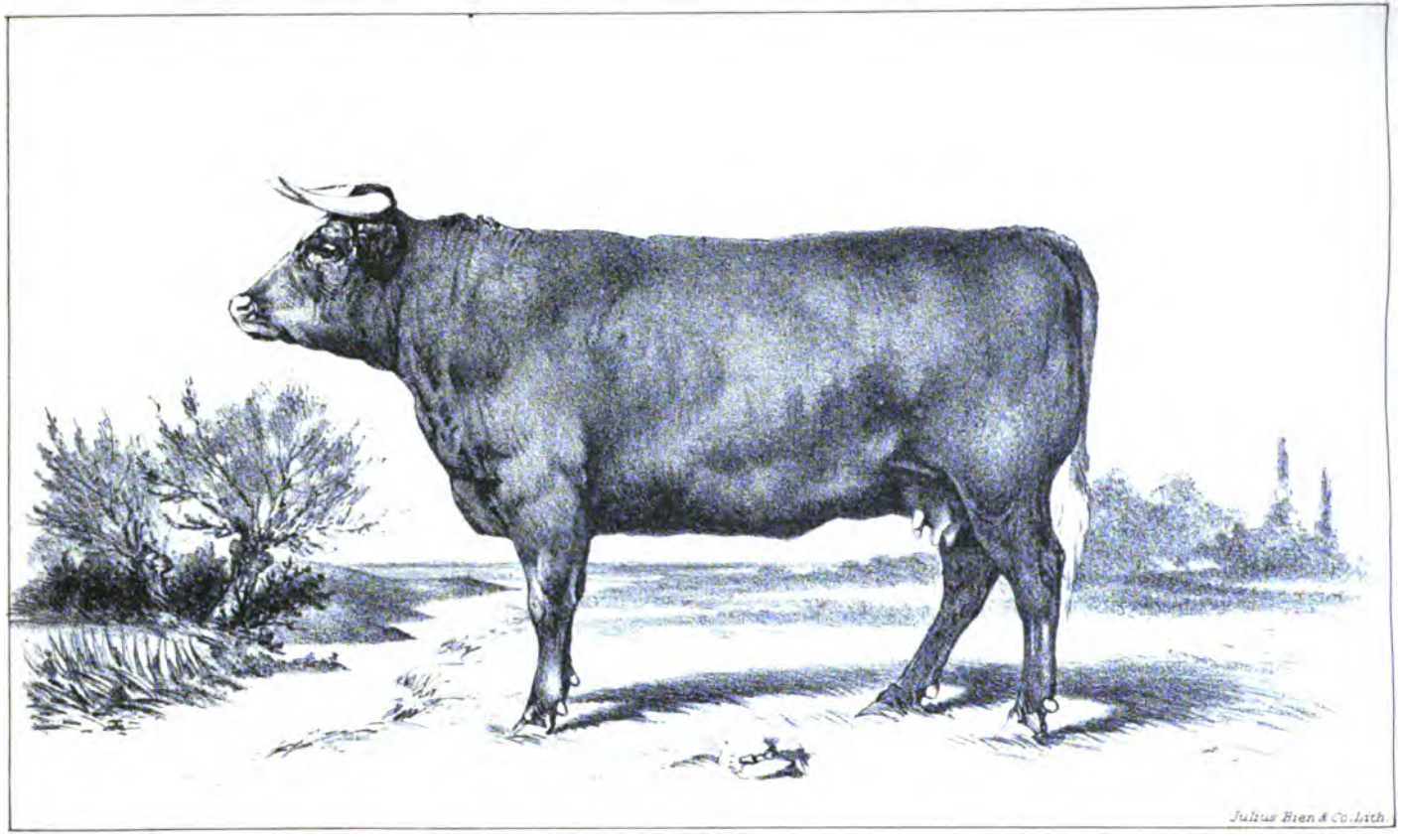


MRS. S. EDWARDES' HEREFORD HEIFER "LEONORA"



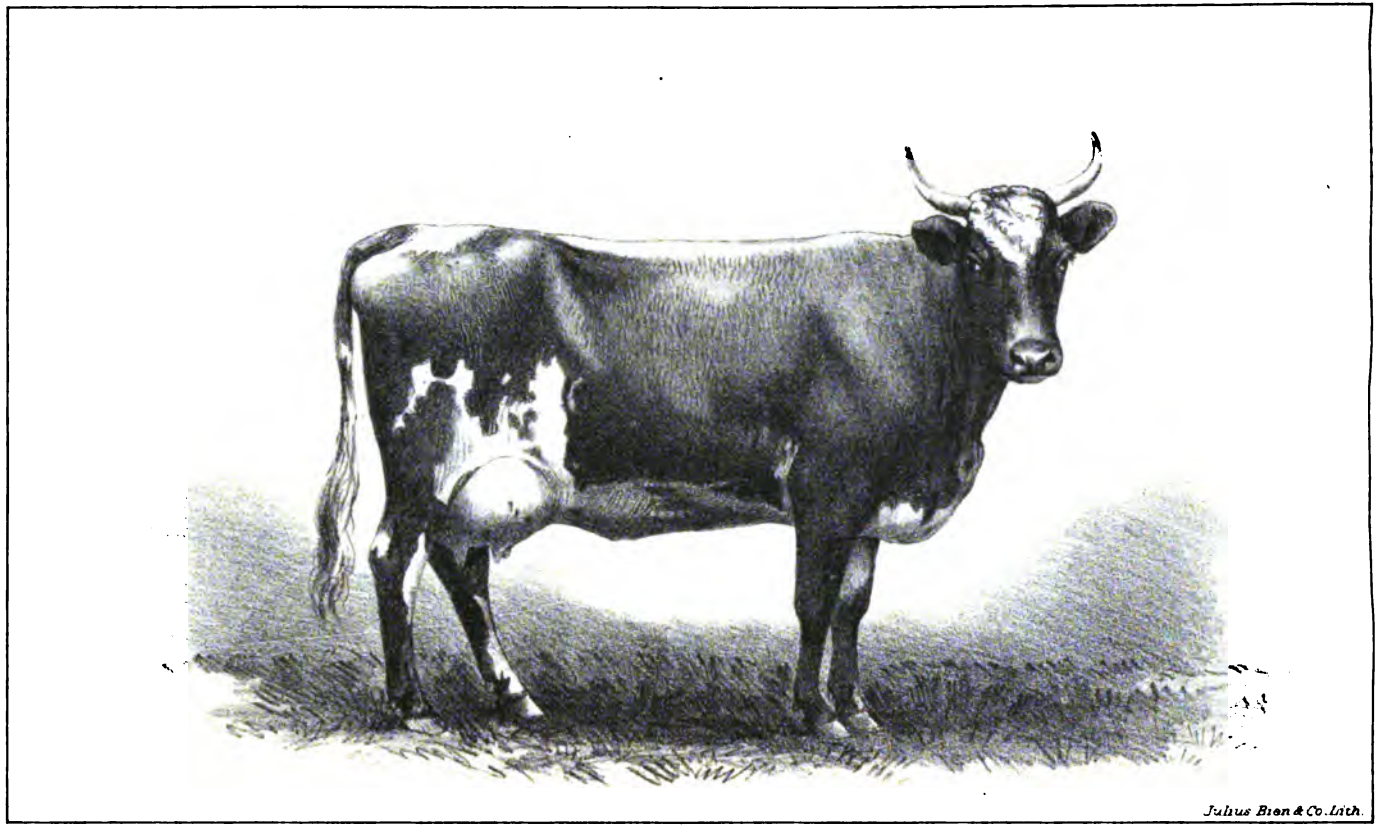
MESSRS. HEASMAN'S SUSSEX HEIFER

FIRST PRIZE AT TUNBRIDGE WELLS



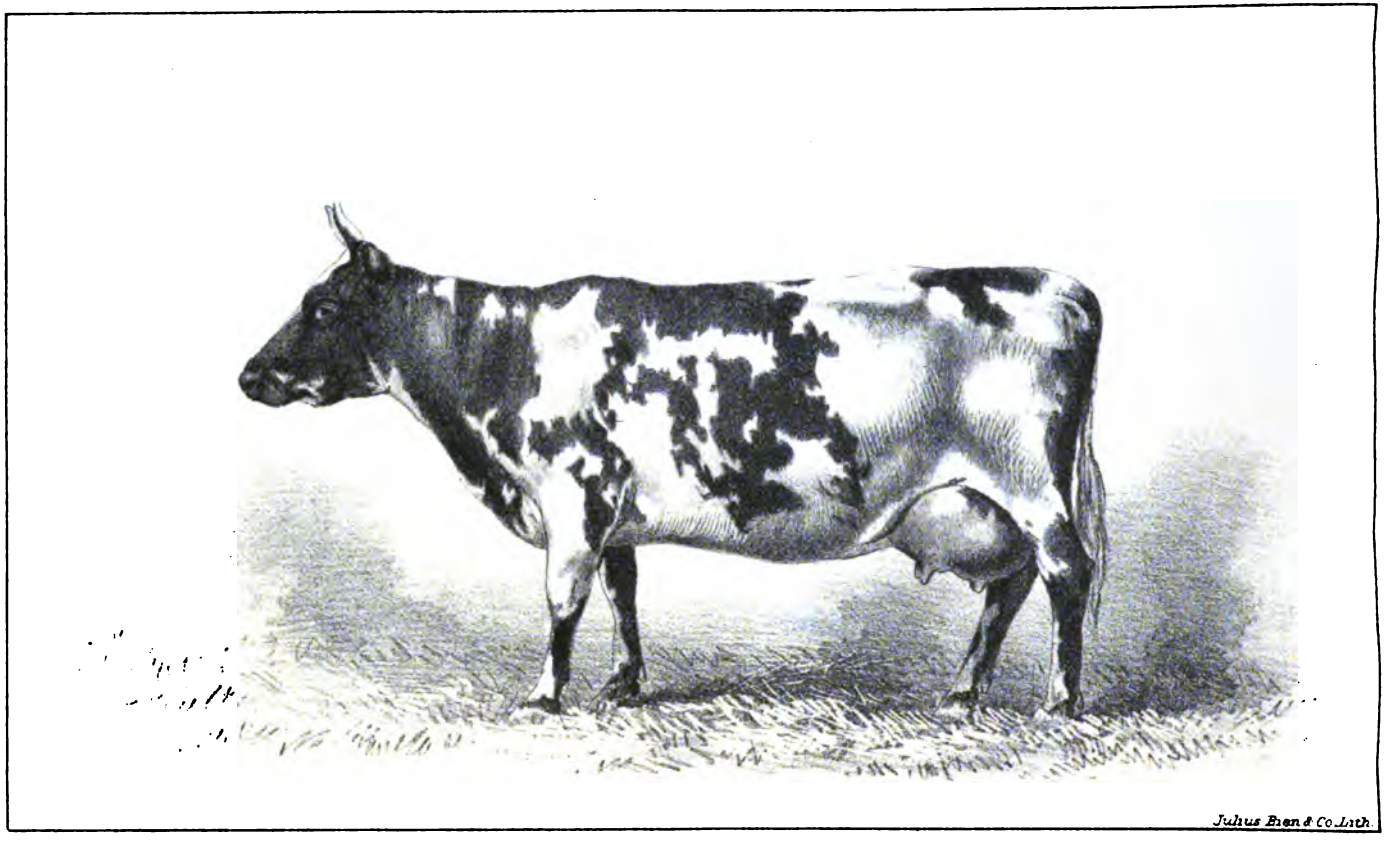
MR. J. S. HODGSON'S SUSSEX HEIFER

SECOND PRIZE AT TUNBRIDGE WELLS



AYRSHIRE COW "JANE"

FIRST NUMBER CLASS AT ST. LOUIS



AYRSHIRE COW.

PORTRAITS OF BRITISH PRIZE CATTLE—Continued.

H. JERSEY CATTLE.

Jersey heifer and calves.—The portrait represents a heifer with calves of the Jersey breed, taken by instantaneous photography by Messrs. Scheiber & Son, of No. 818 Arch street, Philadelphia. Their sire was bred by Mr. E. Gibrout, St. Lawrence, Jersey, and was winner of his parish prize when about ten months old, having had at that age accorded to him twenty-eight out of the thirty-one points in the Jersey scale; then winner of first prize, as three years old, at State Fair at Utica, September, 1870, heading the prize herd. He was sold to Mr. E. Delafield Smith at $600. It will be seen in the sketch that the fore legs of the older calf or heifer cover one another. Her proper left fore leg touches the ground behind the other, and an awkward appearance of width in the two legs, which are hardly distinguishable above the knee, is thus explained.

Jersey cow Velveteen.—The portrait represents Mr. John Cardus's Jersey cow Velveteen, which took the first prize in the cow class, and not that of Dorothy. Mr. Cardus sent three animals (of six entries) to the show, and was awarded first prize for Velveteen in the cow class; second prize for Snowflake in the heifer class, under three years, but over two years old; and first prize for Dorothy among the young heifers. Velveteen was seven years old in June last. She was selected in the Island of Jersey by Mr. E. P. Fowler for exportation to the United States, in June, 1879, then two years old; she is by Grey Prince (168), Jersey Herd Book foundation stock, out of Valentine (734), bred by Mr. Le Brocq, St. Peter's Jersey. She was not, however, allowed to go to America, for Mr. C. B. Dixon (late of the Vinery, Shirley, Southampton) picked her out from some twenty or thirty others in the Southampton Docks, and rescued her from expatriation, and after breeding two calves for him, Mr. Cardus bought her in the autumn of 1879. She calved in July, 1880, a heifer calf, Vixen, who took the first prize at the Royal Agricultural Show at Derby, in 1881, in the heifer-calf class, and was highly commended at the Dairy Show, Islington, in 1882. In July, 1881, she produced Victress, who took first prize at the Royal Counties Society's Show at Winchester, in 1883, and was highly commended at the Royal Agricultural Show at Reading, in 1882. In 1882 she calved prematurely a bull calf, killed; and this year, 1883, she produced a heifer calf, Velvet. Vixen, her calf of 1880, was by Dairy King (211), and her calves of 1881, 1882, and 1883, by Baron Lionel (904), son of Dairy King.

Jersey cow Alice.—Alice was 2½ years old at the time the portrait was taken; she was bred by Mr. F. Le Brocq, St. Peter's, Jersey.

Jersey cow Longueville Belle.—The portrait is a very successful representation of the very beautiful Jersey cow bred by Mr. Laurens, of Longueville, St. Saviour's, Jersey, and exhibited by Mr. James Blyth, of Woodham, Stanstead, Essex, at the Royal Agricultural Society show, where she was highly commended in her class, being then a three-year old in calf, having previously calved in August, 1880.

Jersey cow Coomassie.—This cow (the property of Mr. S. M. Burnham, Saugatuck, Conn.) is numbered 1442 in the "Foundation Stock" of the Jersey Herd Book, and 11874 A. J. C. C. H. R. She was calved in 1871, and won five prizes on the Island in as many successive years, 1876–1880 inclusive—first in the young cow class, then as an "old" cow, and the last three times as the "champion," besides four first parish prizes from 1874 to 1876. She brought with her from home the following remarkable butter record: In seven days in 1878, 14 pounds 15 ounces Jersey, equal to 16 pounds 11 ounces American; in 1879, 14 pounds 11 ounces Jersey, equal to 16 pounds 7 ounces American; and in 1880, 14 pounds 13 ounces Jersey, equal to 16 pounds 9 ounces American. It should be added also that the photograph was taken four months after calving, when her milk production was past its height.—*Albany Cultivator, U. S. A.*

Guernsey bull and cow.—The portraits represent a bull and cow of the Guernsey breed shown at Tunbridge. The bull is Squire of Vauxbelets, exhibited by Mr. James James, of Les Vauxbelets, Guernsey, taking the prize as the only bull in its class. The cow has been unfortunately misnumbered by the photographer. Perhaps the owner may recognize her from her very satisfactory engraving. We presume that she is a prize cow in class 60 or 61 of the Tunbridge Wells show. The engravings cannot represent in colors yellow and white which characterize the breed, but they can at any rate illustrate the form and beauty of the animals, and the milk-like appearance of the cow. They were in classes remarkable for number and excellence.

Guernsey cow Elegante.—The above is a plate of a Guernsey cow, now well known among Guernsey breeders—Elegante, No. 592 (No. 198 in the island registry). The engraving conveys a very accurate idea of her in all respects except color. Her colors are

pure white and light lemon fawn, and the latter is no darker on the head and neck than on the body. Her skin, as seen in the ear, the udder, and, in fact, on any part, is not nominally, but actually, that of gold, and it is not necessary to approach her or open the hair to see the glow.

I. WELSH BLACK CATTLE.

The Black cattle are natives of the counties of Pembroke, Carmarthen, and Cardigan, and are more generally known as Pembrokeshire Blacks, subdivided into Castlemartin and Dewsland breeds. From Cardiganshire they also extend along the North Wales coast up to Anglesea. Professor Wrightson, of the College of Agriculture at Downton, near Salisbury, considers that the Hungarian and Podolian cattle are of the same breed as the Black Cattle of Wales.

Mr. Richard H. Harvey, in his preface to the Welsh Black Cattle Herd Book, says the cattle are generally of black color. Occasionally there are some cows striped—red and black—also some quite white, with black ears, muzzle, and feet; but these are becoming very rare. The late Lord Dynevor had some very fine specimens of the white breed near Llandilo, and the five-year-old oxen were fine animals. The horns should be of a rich yellow; they are generally tipped with black, and do not come out yellow to the very end, like the Herefords. There is a different pitch of horn for bulls and cows. A bull's horn should be low, and well spread; the cow's narrower, and the pitch more upright.

The steers and oxen take more after the bull. This description applies in a great measure to the Anglesea cattle. They are, however, broader on the back, and shorter in the legs, with more hair. The heads are heavier and horns not so yellow.

To this description, however, Mr. Morgan Evans, who was a breeder of these cattle, took exception. He never saw a black cow with a dark-brown face.

They should have the hair long and wavy, neither short and crisp nor very curly. A brown-black wavy coat is to be preferred to any other. A white udder and a gray or white tuft of hair at the end of the tail is the only deviation from the self-color—black or brown-black—admissible.

The natural characteristics of the breed may be described as narrow on the shoulder and chine, slack on the loins, an inclination to be high on the rump, and flat-sided.

No cattle withstand cold and wet with greater hardihood than the Blacks. Their home is in a stormy clime, and the robust Blacks roam in the fields, their only shelter being the earth-banks of the inclosures. Cows and heifers frequently calve in the tempest or knee-deep in snow with apparent comfort, and without injury to their offspring.

Docility.—The docility of the breed is remarkable. A stranger may go safely into a herd of cows, but it is not safe to do so where there is a bull, unless accompanied by some person acquainted with its habits. Bulls, after they are one year old, should always be kept in the house, not only avoiding accidents, but enabling the farmer to regulate the times of calving. The cows stand very quietly to be milked in the yard or in the house, and with their large full eyes and quiet expression look the very picture of docility. They are most useful dairy stock, as the have a good flow of milk, of more than average quality.

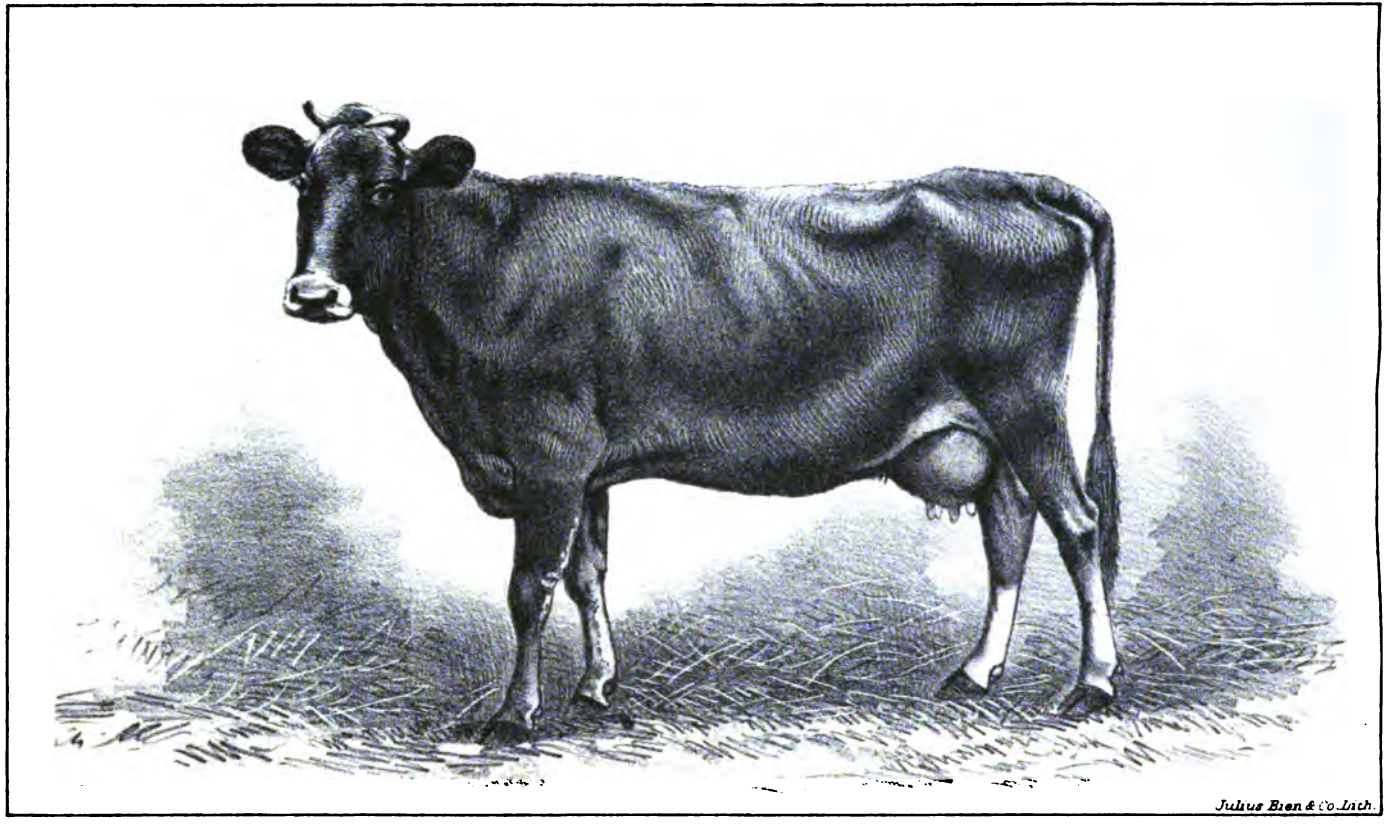
Fattening.—It is admitted that the Black breed will fatten at an early age, and, when reared like the improved breeds, will make good weights. Looking at the soil, the climate, and the accommodation for them during the winter, they are the only breed that will pay the farmer's rent.

Mr. G. F. Bowden, of Somersal, near Derby, never ties up any of his cattle, only those he milks and finishes off for the butcher. The calves reared on their dam's milk at one year old are as big, better hair and coats, than those reared by hand at two years old. Other calves Mr. Bowden rears on skim milk, Simpson's calf meal, and a little dissolved oil-cake. For feeding purposes it is considered best to buy barren heifers and bullocks turned three years old.

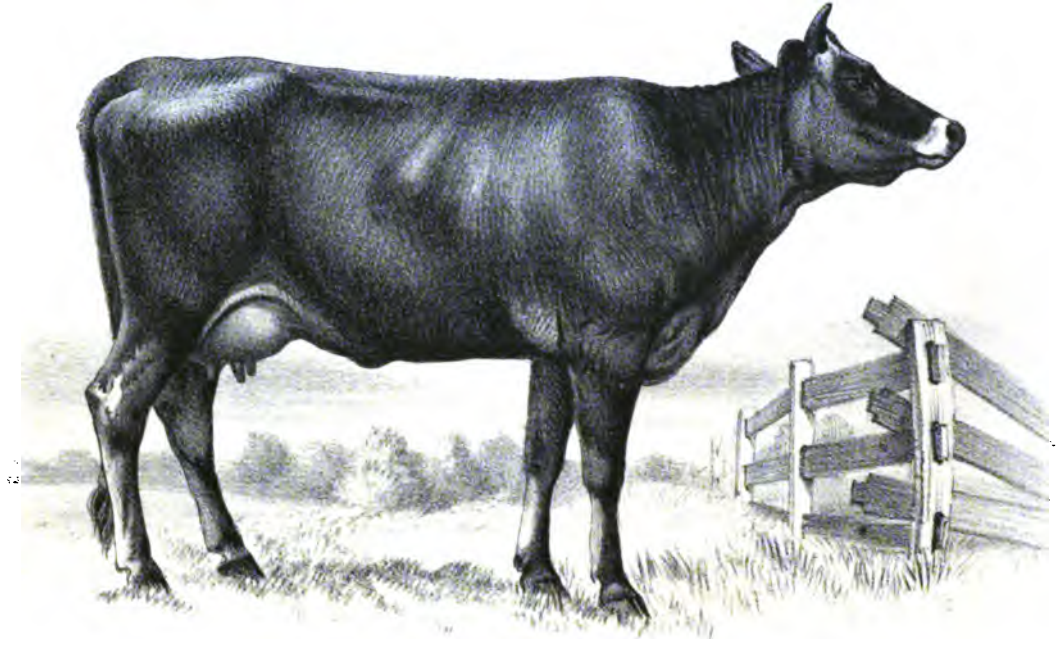
Note, by Consul-General Merritt.—Another breed, the large Black or Runts, is of great size with immense horns. At the last Smithfield show, 1883, the heaviest beast was a Black Welsh.

Julius Bien & Co Lith

JERSEY CALVES



JERSEY COW "VELVETEEN".



Julius Ehon & Co. Lith.

MR. H. J. CORNISH'S JERSEY HEIFER "ALICE"

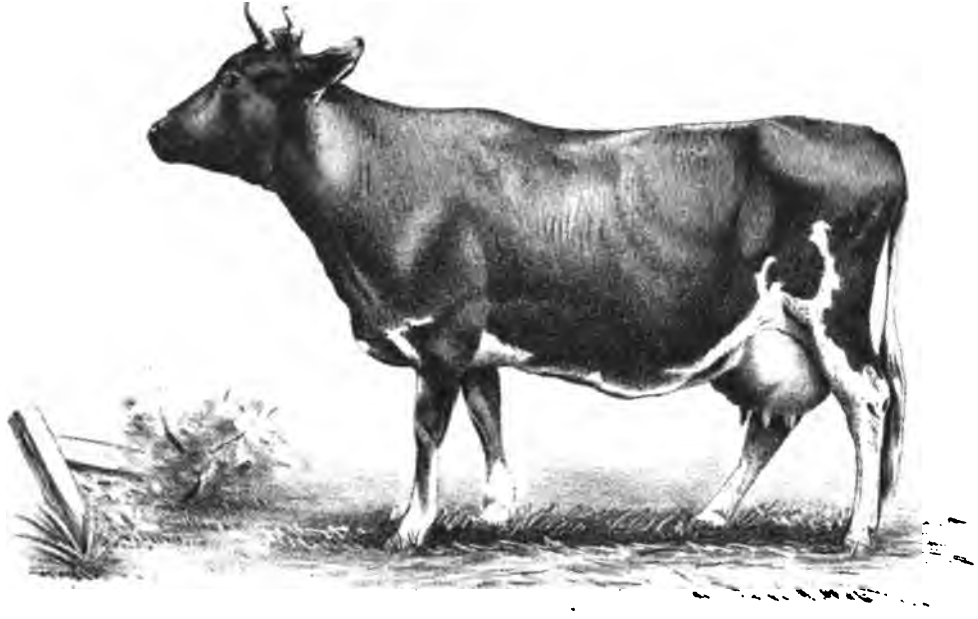
FIRST IN HER CLASS AT READING

MR. JAMES BLYTH'S JERSEY COW "LONGUEVILLE BELLE"

JERSEY COW "COOMASSIE"

Julius Bien & Co. Lith.

JERSEY COW "LUNA"



MR. J. JAMES' GUERNSEY COW "LADY EMILY FOLEY 2ND"

FIRST AT READING FIRST IN HER CLASS AT ISLINGTON

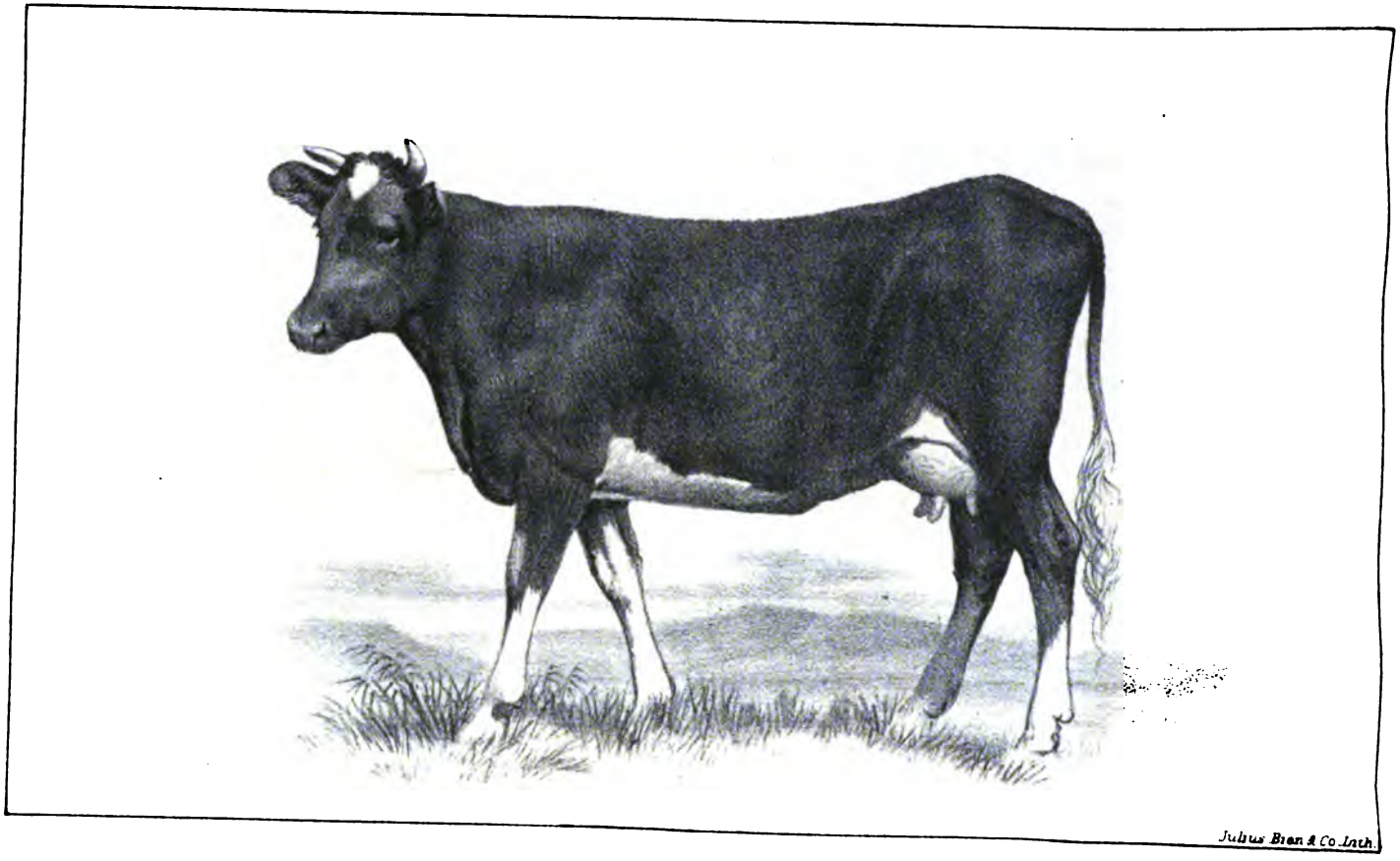
Julius Bien & Co. Lith

MR. J. JAMES' GUERNSEY COW "VALENTINE 3RD"

SECOND PRIZE IN HER CLASS AT READING

GUERNSEY BULL

SHOWN AT TUNBRIDGE.

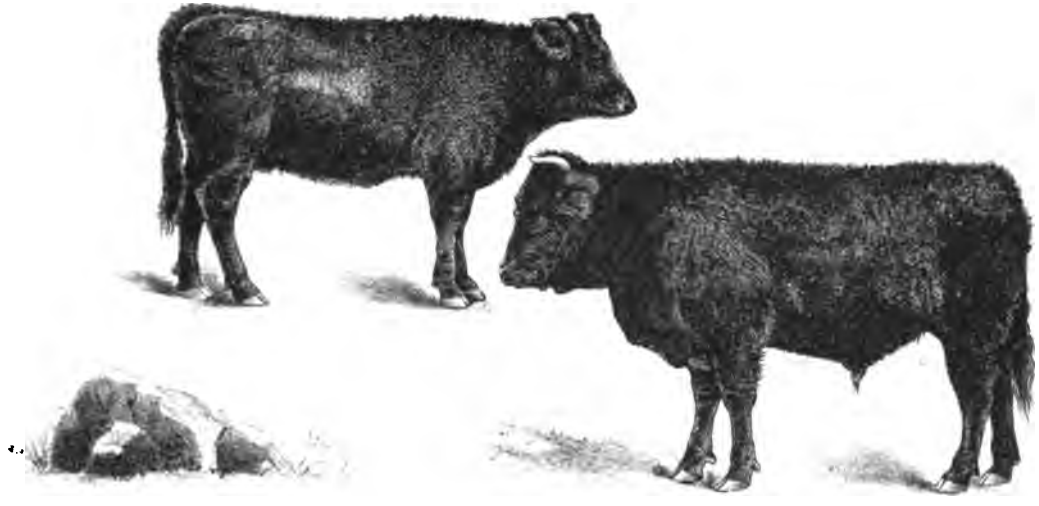


Julius Bien & Co. Lith.

GUERNSEY COW

Julius Bien & Co. Lith.

MR. L W. LEDYARD'S GUERNSEY COW "ELEGANTE"



Julius Ehen & Co Lith

YEARLING BULL AND HEIFER

WURTEMBURG CATTLE LAWS.

In order to put into general practice some system of cattle-breeding which should be universal throughout the kingdom and be governed by the experience of years, the Wurtemburg Government promulgated on the 16th of last June a detailed law providing for the maintenance in each township of a sufficient number of breeding bulls of a race or races adapted to the demands of the locality. This law is so thorough and systematic in its provisions that notwithstanding its length I deem it worth while to incorporate it bodily in my report as a model by which possibly other cattle-breeding communities may be guided.

Law in regard to the keeping of bulls.

[Enacted June 16, 1882.]

ARTICLE I.

Townships shall be obliged to maintain a proper number of bulls for breeding purposes in their respective districts in proportion to the existing number of cattle, and so far as is not otherwise provided for. A number of townships or subtownships may associate themselves together for the joint maintenance of the proper number of bulls. This joint action shall be effected by agreement of the citizens through their proper representatives. (Article VIII, section 5 and 6, of the statute of September 17, 1853.) In subtownships, defined by distinctive boundaries, the keeping of bulls is obligatory upon the subtownships, so far as nothing to the contrary is established by usage or previously existing contract. (See Article VII of the statute of September 17, 1853, concerning relations between adjoining townships, Reg. Blatt, page 389.)

ARTICLE II.

Townships may arrange for the keeping of the bulls under their own direction, or under that of a duly appointed bull-keeper. In the latter case a contract must be made for a period not less than six years. The taking charge of the bulls for a shorter period, or by several persons together, or by the individual cattle owners alternately can only be permitted in exceptional cases, subject to revocation by the county authorites upon the advice of the inspecting officers.

ARTICLE III.

Any appeals by the townships against the carrying out of Article I, section 1, by the county authorities, as well as against a refusal by the said county authorites in the case of Article II, section 2, shall be made to the kreisregiciung (district authorities), whose decision shall be final.

Appeals must be brought within two weeks after the promulgation of a decision by the county authorities.

A delay beyond the period named involves the loss of right to appeal. The same result holds in the right of appeal by the county authorities. No advice will be given in regard to redress.

ARTICLE IV.

To defray the expense incurred by the township for the maintenance of bulls, the township may itself levy a breeding-fee for the use of the bulls, or allow the levying of the same by the bull-keeper appointed under the provisions of Article II.

The consent of the county authorities shall be required to establish or abolish breeding-fees, as well as to increase or diminish the amount of the same.

ARTICLE V.

The breeding-place shall be in the neighborhood of the stalls where the bulls are kept, and shall be closed to the admittance of strangers, or from observation from without. In towns not complying with this direction the covering of cows will not be authorized.

ARTICLE VI.

Only bulls for which a permit has been issued shall be kept either by the townships, by the bull-keepers appointed under contract by the townships, or by property-owners.

The same restriction applies to those private persons owning bulls which are regularly, either in whole or in part, kept for the covering of others' cows.

Permits shall only be issued for such bulls as have upon examination been adjudged fit for breeding purposes by the inspecting authorities. Township bulls (see section 1) shall, moreover, be adapted to the breed of stock dominating in the township.

ARTICLE VII.

Permits are valid until the next regular inspection (Article X), and anywhere throughout the kingdom. They may be revoked by the inspectors of the district in which the bull belongs, in case the bull proves unfit for breeding purposes.

ARTICLE VIII.

The board of inspection competent for the issue or revocation of such permits shall consist of three regular members and an equal number of substitutes, who serve in case of the personal interest, or other hindrance of regular members. The same are to be appointed by county districts for a term of three years at the official meetings and simultaneously with the appointment of the presiding officer and his substitute. In districts in which, under the provision of the statute for organizing agricultural associations, dated April 12, 1877 (Regierungs Blatt, page 143), a regularly organized district association exists, the election of members of the board of inspection, with the exception of the presiding officer and his substitute, is to be left to the committee of the association.

A resolution of the board of inspectors (with the exception pointed out in Article II, section 1) is only valid when adopted in full session.

ARTICLE IX.

Members of the board of inspectors may on application to the county authorities resign their office before the expiration of the time for which they are appointed. They may be involuntarily dismissed from office by order of the county authorities on a decree from the ministry of the interior when based on good grounds.

ARTICLE X.

The board of inspection shall annually, on a day to be fixed by the presiding officer in conjunction with the royal county authorities, make a regular inspection of the bulls in each township, with a view to determining the question of the issue of permits. At the same time inquiry shall be made as to whether the provisions of Articles I, II, and IV are complied with.

The result of their inspection, especially in relation to any irregularities discovered, shall be reported to the county authorities.

Special meetings of the board of inspection may be called by the county authorities in cases when, after the issue of a permit for a bull, and previous to the next regular inspection, such facts may come to the county authorities' knowledge as seem to render necessary a revocation of the permit. Likewise, in other cases of emergency, the board of inspection, or an individual member thereof, may be charged by the county authorities with the duty of making an inquiry into the condition of the bulls in a township.

ARTICLE XI.

Applications for the issue of a permit after the making of the regular inspection shall be decided upon by the presiding officer of the board of inspection, or some other member acting under his authority.

In case the application is not made by a township official the applicant must, prior to the inspection being made, deposit the amount of the costs arising therefrom with the chief magistrate of the village.

ARTICLE XII.

Appeals against a refusal or revocation of a permit may be made to the superior board of inspection by a member of the common council, so far as it pertains to the case of a township bull or by the bull-keeper. (Article III.)

Such appeals must be brought within two weeks after the promulgation of the county authorities' decision, either verbally dictated in protocol form or in writing. In such case the provisions of Article III, section 3, are equally applicable. Unless the appeal is made by the common council the appellant must at once, or within a time to be named by the county authorities, deposit a sum adequate to defray the costs arising from the appeal. In case this deposit is not made, or if the appeal appears to be untenable, it may be dismissed by the county authorities, otherwise it is to be handed over to the presiding officer of the superior board of inspection.

ARTICLE XIII.

For deciding upon appeals against the refusal or revocation of a permit a superior board of inspection holding office for a space of three years shall be appointed in each agricultural association district.

Said board shall consist of three regular members and an equal number of substitutes, who serve in case of the personal interest or other hindrance of regular members.

The presiding officer and other members as well as the substitutes shall be appointed by the Centralstelle for Agriculture upon the recommendation of the respective committees of the agricultural associations.

The provisions of Article IX govern the action of the members of the superior board of inspection with the understanding that the Centralstelle for Agriculture acts in the place of the county authorities.

The superior board of inspection must furnish grounds for any resolution adopted by it in full session. Its resolutions are final. No fees are to be charged.

ARTICLE XIV.

Any further provisions in regard to the organization of the boards of inspection and superior boards of inspection, the indemnification of their members and the conduct of their proceedings shall be promulgated through the ministry of the interior.

ARTICLE XV.

In the case of Article X, section 3, he who may have brought about a special inspection without just cause, shall bear the costs incurred.

The costs of a special inspection as provided for in Article XI fall to the charge of him who proposed it, and the costs of a rejected appeal (Article XII) to the charge of the appellant.

All other costs arising out of the action of the boards of inspection and the superior boards of inspection are to be borne by the corporation in whose district the bulls are.

The county authorities shall act in first instance for the imposition of the costs.

ARTICLE XVI.

Violations of the provisions of Article V and Article VI, sections 1 and 2, shall be punished with a fine not exceeding 100 marks. The fines go to the treasury of the corporation.

Articles IX—XXV of the law of the 12th of August, 1879, in relation to the amendment of the rural police law of December 27, 1871, and the proceedings relative to the imposition of fines by the police, are here equally applicable.

ARTICLE XVII.

The provisions of the present law shall take effect on the 1st of May, 1883, with the exception of Article VI, sections 1 and 2, which shall not go into operation until the 1st of January, 1884.

Our ministry of the interior is charged with the execution of this law.

DECREE FOR THE CARRYING OUT OF THE FOREGOING LAW.

[The following decree, though extremely detailed in its interpretation of the law to which it relates and upon which it is based, contains, nevertheless, many points of interest to stock-breeders, and is therefore herewith appended.—Note by Consul Catlin.]

Decree of the ministry of the interior providing for the carrying out of the law of June 16, 1882, in regard to bull-keeping.

[October 31, 1882.]

For the carrying out of the law of June 16 of this year in regard to bull-keeping (Reg. Blatt, page 205), it is with the approval of His Majesty the King decreed as follows, namely:

ARTICLE I.

1. Townships shall take charge of the bull-keeping, in so far as the necessity for it there exists; especially in so far as cattle-owners in the township are not in a position themselves to keep the bulls requisite for their cattle; and in case where the keeping of bulls in some other manner, viz, by contracts with a third party, is not already provided for. If by contracts with a third party or by other arrangement the actual requirement is only supplied in part, or in the event that those who hold contracts do not fulfill their duty, the township shall, according to the requirement, supply the demand.

If in a township some cattle-owners keep their own bulls for their cattle and allow other cattle-owners the covering of their cows by such bulls under the condition that the latter serving for the use of others' cattle be supplied with permits, and that they be adapted to the breed of cattle in the township, then bull-keeping by the township can be dispensed with so long as no necessity for it exists and no inconvenience results therefrom. If through existing contracts with third parties only a part of the requisite number of bulls is kept and yet the bull-keeping be in general in charge of the township, then in order to avoid inconveniences resulting from such conditions, relief is to be sought through the said existing contracts with third parties.

In adjacent townships, consisting of a greater number of subtownships, as well as in isolated townships, a joint system of bull-keeping corresponding with the local requirements and on a proper arrangement between the subtownships is to be aimed at. It is hereby made known that the law permits associations of subtownships with various townships, and of subtownships with single townships, and that it is also permitted to such associations to keep bulls, if only for a single breed of cattle. An approval after inspection by the police is not necessary for associations of this kind.

2. As to number and breed of bulls to be kept the following rules are to be observed:

To every 80 cows and full-grown calves at least 1 bull should be kept. But if there be in one township 400 or more cows and full-grown calves, then 100 cows and full-grown calves may be reckoned to 1 bull, if the bulls are together and kept by one and the same person.

The breed of the bulls must correspond with that of the cattle in the township, or must be such as can be advantageously crossed for the raising of good cattle.

The township is not obliged to keep special bulls for cattle of an exceptional race. But should there be more races in the township not suitable for crossing (article 6, section 3, of the law), then for each of these single races special bulls are to be kept. A race is to be considered sufficiently numerous if there be 40 cows and full-grown calves.

In reckoning the number of bulls to be kept by the township only those female cattle are counted for the covering of which the bulls are to be kept. There remain to be counted separately those female cattle for the covering of which the owners keep their own bulls; and again, if bulls of different races are to be kept, for example, for 150 cows, of which 100 belong to one and 50 to another race not suitable for covering, 3 bulls are to be kept, while for 150 female animals of one and the same race 2 bulls suffice. If on account of the condition of the bulls or from some other cause the proportion in number be not sufficient, then the township shall keep more bulls according to the requirements of the case.

ARTICLE 2.

3. The management of bull-keeping by the township is everwhere recommended where local conditions permit. But if the bull-keeping is not in the charge of the township, it is desirable that the bulls should be bought by the township and remain their property.

If a bull-keeper is charged with the bull-keeping by contract, then, in the first place, in charging him, it is to be seen if his capacity can be trusted—if he have proper stalls and a place for exercising the animals, according to article 5 of the law, and if he has or buys sufficient food of a proper quality. Care should be taken not to award this position to the highest bidder; but should proposals be received, it must be with the condition that the township have the choice among the applicants, and the position is only then to be awarded to that one who will serve for the least wages, provided there is certain ground for believing that the bulls will be well cared for by him. In the township minutes it is to be recorded that no doubt exists on this point.

4. The post of bull-keeper under the provisions of the law is not to be awarded for less than six years, but as a rule should be awarded for a longer time, so that the bull-keeper may be in a position to make the necessary outlays for the proper fulfillment of his contract. The township has, however, the right to release the bull-keeper from his contract before its expiration if any failure in the fulfillment of his duty can be shown. The bull-keeper's wages must be so fixed as to give him a proper remuneration for his time, trouble, and expense.

5. Under the exceptions of the law contained in article 2, section 2, townships are to observe the following principles:

The awarding of the post of bull-keeper for a shorter period than six years is only to be permitted where exceptional local or personal conditions render a six-year contract impracticable. Its awarding to several persons at once may only take place under certain local conditions, as, for example, if the farms belonging to the township be located far apart, and then only if there is no risk of a disadvantageous rivalry between the bull-keepers on the too frequent use of a single bull.

If bulls of different breeds are kept, then, in exceptional cases, where no doubt exists, a special keeper may be allowed for the bulls of each individual race.

The alternate awarding of the post of bull-keeper to individual cattle-owners may only be permitted in those townships which consist of scattered farms, and then only in cases where it is shown that those cattle-owners among whom the bull-keeping is to alternate are capable of fulfilling their duties in a proper manner.

The foregoing exceptions are based upon the condition that the rule of article 5 in reference to location and kind of places for exercise are complied with. Moreover, exceptions of this kind are only to be permitted for a stated period.

Article 3.

6. It is the inspector's duty in the regular inspection of bulls, as well as by special request of county authorities, to examine whether the townships fulfill their duty in reference to bull-keeping and to give their opinion to the said authorities. They are also by joint counsel with the county authorities and bull-keepers to aim at improvements and as much as possible prevent irregularities.

The county authorities in carrying out the law (according to articles 1 and 2, and in fulfillment of the above rules) are to hear the opinion of the inspectors and as far as possible to commission the board of inspectors or a member of the same with the investigation of the bull-keeping in any given township; also to provide a check through another member of the board of inspectors to see that the commission is properly executed. If the county authorities have doubts on the opinion of the board of inspectors, they are to address themselves to an overinspector for an inquiry, submitting a statement of the facts in the case.

Where the district authorities are called on to decide upon an appeal, it is left to their choice to ask the decision of the inspector or overinspector, or, if required, the central stelle for agriculture.

Article 4.

7. The increase of fees for the use of bulls is to be allowed in townships where (*a*) cattle-owning is distributed very unevenly among the population; (*b*) a loss to the township is occasioned or increased through bull-keeping, and has thereby to be borne by tax-payers who derive no immediate profit from it, as, for instance, trades-people or land-owners owning cattle in the township, or those who keep their own bulls, or where (*c*) on account of there being several breeds of cattle more bulls have to be kept than if there were only cows of one and the same race. In such townships a proper fee is to be charged, and the increase or decrease of the same only to be allowed by the county authorities when there is no unjust burden occasioned to some tax-payers to the benefit of others.

Such increase or decrease of fees in townships which sustain no loss and do not incur any loss thereby will not as a rule be objected to.

ARTICLE 5.

8. It is to be observed that the provision of article 5 with regard to locality and character of places for covering and the prohibition against covering in a place not corresponding to these regulations, not only refer to the employment of township bulls but also to bulls of private parties, whether they be used for covering their own or others' cattle.

ARTICLE 6.

9. The provisions of article 6 are not applicable to bulls kept on Government or royal farms.

According to the provisions of article 6, sections 1 and 2 (also article 16), in future the use of bulls without a permit is allowed only so far as they are kept by private persons exclusively for the covering of their own cattle. Although the exceptional use of a bull without a permit for the covering of others' cattle is not punishable, yet the police authorities are to see that the provisions of the law are not thereby evaded; and special attention is directed to the circumstance that a frequent or regular use of private bulls without a permit is punishable, even if no fee be paid.

Permits can only be withheld for the reasons mentioned in article 6, section 3.

"Township bulls" in the meaning of the law are to be considered as not only those mentioned in article 6, section 1, but also those which are kept under contract by third parties for breeding purposes in the district.

ARTICLE 7.

10. In case of any change in the ownership of a bull the right granted by the permit passes over to the new owner. In such case the permit may be transferred by means of an indorsement upon it from the president of the board of inspection which issued it, provided that the identity of the bull transferred is established. Such transfer is to be entered in the minutes of the board of inspection. (Section 18.)

11. If there come to the knowledge of the authorities facts indicating the unfitness of a bull for breeding purposes, and a consequent necessity for the withdrawal of the permit, the bull owner is in the first place, in consideration of article 7, section 2, of the law and of the costs arising from the appeal, to be requested to give up the permit.

If this summons is not complied with, the board, which can only in full meeting order the withdrawal of the permit, is to be assembled.

The county authorities are to inform the board of inspection which issued it of the withdrawal or voluntary return of a permit in order that the necessary note may be made by them in the minutes (section 18). (See further section 21, sections 1 and 3.)

If a township bull, even though not unfit for breeding purposes, yet proves not adapted to the breed prevailing in the township, the county authorities shall require the removal of this bull from the township, but no withdrawal of the permit in such case is legal.

ARTICLES 8–11.

12. The election of the board of inspection is to take place in such manner that the ordinary members, the substitutes, the president, and the vice-president are chosen by separate ballots. An ordinary member may be elected as vice-president pro tem. In this case every time such member acts as vice-president a substitute is to fill his place in the meetings.

Substitutes are not elected as such for any particular regular member, but for any regular member. Therefore, the president may choose as to which one of the substitutes he wishes to call in in individual cases.

Wherever no special reasons exist to the contrary, that substitute is to be called upon whose substitution involves the least expense.

13. In order to avoid delay in the election of the board of inspection, the county authorities are to summon the committee of the agricultural district association at least four weeks before the meeting, at which the president and his substitute, and eventually all the members of the board of inspection, are to be elected. (According to article 8, section 3.)

It is left to their judgment so to provide that the meeting appoint the president or vice-president, or both of them, from those elected by the committee of the agricultural district union, and to elect at the same time in their stead one more regular member and one more substitute.

If no doubt exists that the committee of the agricultural district union intend to avail themselves of their right of voting, the meeting may go through the election of president

and vice-president already before the election of the other members on the part of the said committee.

If an agricultural district association does not either at all or within the prescribed time avail itself of its right of voting, the meeting is to elect all the members of the board of inspection, and any subsequent voting by the agricultural district association is in such case invalid.

14. The term of office of members of the board of inspection begins May 1 of the first year and ends April 30 of the last of the three years for which they are chosen.

If members of the board of inspection apply for discharge before the expiration of their term of office, it is to be granted them by the county authorities, after provisions have been made for the necessary substitution and eventual filling of the vacancy in the board of inspection; until discharged, members are to attend to their official duties.

If members of the board of inspection withdraw before the expiration of the period for which they are chosen, a supplementary election for the remainder of that period is to be held. Such election may be omitted, if no necessity exists for the filling of the board.

15. The composition of the Board of Inspection, as well as changes therein, are to be promulgated by the county authorities through the official paper of the district and reported to the superior board of inspection and to the Centralstelle for agriculture.

The president and vice-president, as well as the other members residing at the county seat, are to be sworn by the county authorities and members residing outside the county seat, by order of the county authorities, through the mayor of their place of residence. The following oath is to be used:

"I swear by the Almighty and Omniscient God, that I as a member of the board of inspection will attend impartially and to the best of my knowledge and conscience to the discharge of the duties of the office conferred upon me. So help me, God."

Members of the board of inspection who in the same capacity have already been previously sworn are to be reminded of the oath already made by them.

16. The following persons are on account of personal interest prohibited from participation in the resolutions or decisions of the board of inspection: (1) The owner and any one who during the last two years has been owner of the bull to be inspected; any one else having a substantial interest in the decision of the board of inspection, or any one interested in the use of the bull under inspection, or wherever a township bull is concerned any one contributing to the expenditure of the township for bull-keeping through township taxes. (3) The husband or wife of such parties as are mentioned in articles 1 and 2, even if their state of matrimony no longer exists. (4) Those who are related in direct line, by marriage or by adoption, or related in a collateral line up to the third degree or by marriage up to the second degree to the proprietor of the bull under inspection, even if the state matrimony on which the relationship is based no longer exists.

When the board is assembled it shall decide (otherwise the president) whether any such case of hinderance exists.

17. The board of inspection enters upon its duties upon the call of the county authorities.

The president, or in his absence the vice-president, is required after receipt of the summons to name a date for the assembling of the board of inspection, as well as place and time for the bull inspection, and to summon in season for that purpose the two regular members.

If a summoned member is prevented from taking part on account of personal interest or other cause, he is at once to inform the president of the fact in order that the call of a substitute, and if necessary the putting off of the date, may be made in season.

In case the president is previously aware that a member is prevented from participating he may at once summon a substitute.

Members of the board of inspection who prevent the inspection taking place through unexcused absence or the tardy notice of their inability to attend are responsible to the township corporation for the costs incurred on their account.

The mayor of the township concerned is to be informed in season of the date fixed for a regular bull inspection, or for an investigation of the bull-keeping in the township, or of a special inspection of a township bull, together with the request to be present at the inspection or to delegate thereto a deputy, in order to obtain proper information in regard to the circumstance of the case.

18. To render valid a decision of the board of inspection the co-operation of the president or vice-president and of two other members of the board of inspection is necessary with the exception named in Article XI of the law.

The board of inspection decides by a majority of votes, and as a rule immediately after the inspection of the bull at the place.

The decision of the board of inspection (in the case of section 22, also those of any of its members) are to be entered on a current minute-book to be kept according to

the blank form provided in Appendix A (see Inclosure V). The record may be made either by the president or another member of the board named by him.

In case the board decides upon granting a permit, such permit is as a rule to be made out at once according to the blank form provided in Appendix B (see Inclosure V), to be certified to by the seal of the board of inspection and the signature of the president, and to be handed to the claimant.

If the withholding of the permit is decided upon, the grounds therefor are verbally stated to the bull-owner and briefly to be noted in the minutes.

In exceptional cases the transmittal of the permit or the communication of the refusal may take place through the medium of the mayor.

If a permit had been previously issued for the inspected bull, such permit must be delivered up to the board and by it destroyed.

19. If no farrier be a member of the board it may, where for special reasons the decision as to the granting of a permit depends upon the result of a veterinary examination of the bull, propose to the county authorities the holding of such examination and the reporting of the result. The decision of the board is, however, in such cases to be so rendered that it can be acted upon on communication of the result of the examination without another inspection of the bull, thereby causing further expenses, and without further oral consultation of the board.

20. The committee of the Agricultural District Association and the township meeting are to be summoned by the county authorities to express their opinions as to the time at which the regular annual bull inspection shall be held. Upon such opinions the President of the Board, with the consent of the county authorities, shall fix the date for the bull inspection in the different townships with all possible regard to the saving of expense.

In making the regular bull inspection the board is at the same time to make inquiry in the different townships as to whether the bull-keeping is in compliance with the prescriptions of articles 1, 2, and 5 of the law, and of sections 1, 5, and 8 of the present decree. The result of this inquiry is to be entered in a special current record of visits made, which record is to state:

(1) The number, race, age, and quality of the township bull (section 9, last section), and in the cases of section 1, section 2, of the bulls mentioned therein.

(2) The number and race of the cows and full-grown calves in the township district, whereby if there are different races the number of animals belonging to each race, is to be stated separately, deducting those (the number of which is to be stated) for the covering of which the owners keep special bulls of their own. These figures are to be placed at the disposal of the board by the mayor.

(3) Method of bull-keeping, *i. e.*, whether under the township's own management, or through appointed bull-keepers, or with or without the purchase of the bulls at the expense of the township, or through third parties under contract for bull-keeping, &c.

(4) Nature of the stalls where the bulls are kept.

(5) Nature of the place for covering.

(6) Maintenance of the bulls.

(7) Irregularities discovered.

(8) Suggestions by the board.

After the termination of the regular bull inspection this record of visits made, with the suggestions offered, is, with the minutes of the inspection, to be submitted to the county authorities for their perusal, and afterward to be returned by the latter to the president of the board of inspection.

21. The granting and withdrawing of permits, as well as the giving up of the same, is to be communicated to the mayor, and to be promulgated by him in the usual manner.

It is left to the judgment of the county authorities as to publishing a statement of the result of the regular bull inspection through the official paper of the district.

If the withdrawal of a permit is legally ordered it is to be reclaimed and destroyed by the president of the board of inspection, if necessary through the medium of the mayor.

To replace a lost permit another may be made out by the president of the board of inspection, based on the bull-inspection minutes. Such claim is to be complied with where there exists no reason for suspecting any fraud.

22. Proposals for granting a permit after the regular bull inspection are to be registered at the mayor's. At the same time, unless the proposal comes from a township authority, an amount is to be deposited with him, which is likely to cover the expenses arising from an examination of the bull at the place where it is kept.

The mayor is to inform the county authorities of the proposal when made, stating the amount deposited.

If the requirement to deposit a sufficient amount for costs be not fulfilled, the proposal is to be refused by a resolution of the county authorities.

In case a sufficient amount for costs is advanced, or if the proposal comes from a township official, the county authorities are to require the president of the board of inspection to bring about a decision with regard to it.

It is left to the president whether he himself will decide on the proposal or whether he will charge another member of the board of inspection with doing so. In this matter he is to consider all possible saving in traveling expenses.

As rules for procedure in other regards the provisions of sections 16 to 19 and 21 are applicable, with the modification that as a rule only one member of the board of inspection makes and decides upon the examination of the bull.

The examination of the bull can be made at the place of residence of the deciding member, if the owner of the bull takes him thither for that purpose.

In exceptional cases a permit may be granted without previous examination of the bull at the place where it is kept, provided the deciding member of the board of inspection is thoroughly informed concerning the bull, in consequence of an inspection held a short time previously, as, for instance, at a recent award of premiums.

The county authorities are to be informed of the decision taken upon any proposal, with a statement of the bill of costs.

23. Upon the special request of a bull-owner the full board of inspection may decide upon a proposal for a permit after the regular bull inspection, if the applicant is willing to bear the cost arising therefrom.

It is left to the judgment of the county authorities, after consultation with the committee of the agricultural district association, to allow, so far as it is necessary, special bull inspections to be held in certain townships by the whole board of inspection if either the cattle-owners concerned or the townships, or, by vote of the township meeting, the township corporation are willing to defray the expenses.

ARTICLE 13.

24. The appointment of the superior board of inspection is, as a rule, to precede the election of the members of the boards of inspection in the district of the circuit association of the agricultural association, as the appointment of the same person as a member of both boards is to be avoided where possible. Accordingly the centralstelle for agricultu re is in due season to call upon the circuit committees of the agicultural association to propose nine experts residing in their respective districts for appointment as memmers of the superior board of inspection.

The composition of the superior board of in spection is to be promulgated through the official papers of the districts concerned.

The members of the superior boards of inspection are by direction of the centralstelle for agriculture to be sworn by the county authorities of their place of residence, using the oath given in section 15. Members of the superior board of inspection, who in such capacity have been already previously sworn, are to be reminded of the oath already made by them.

The provisions of section 14 are properly applicable to members of the superior board of inspection (see, however, article 13, section 4, of the law).

25. If a complaint is transmitted in the prescribed form (article 12 of this law), the county authorities are, in cases where proofs are subjoined, in the first place, to cause the board of inspection to report promptly upon the complaint, and then to send it with such report to the president of the superior board of inspection for further action, stating the amount of costs deposited.

The corresponding provisions of sections 16 to 19 are properly applicable to the proceedings of the superior board of inspection, with the following modifications:

(1) Participation in a resolution or opinion of the superior board of inspection is prohibited to those members who are at the same time members of the board of inspection from which the contested decision comes, or who have participated as former members in the said contested decision.

(2) If the permit is granted in second instance it is to be enforced at once and handed to the claimant, and the county authorities are to be informed of it for the purpose of taking further steps with regard to the costs. But if the complaint is rejected, then—without prejudice to its immediate communication to the claimant—a resolution comprising a brief explanation is to be drawn up and sent to the county authorities to whom the complaint was addressed. The county authorities on their part are to fix the costs to be borne by the complainant, and then to cause the resolution of the superior board of inspection, together with their decision concerning the costs, to be handed to the complainant through the mayor.

26. The members of the boards of inspection and superior boards of inspection are to receive for performing their functions outside the township district of their place of residence 5 marks allowance for an entire day, and a proportional sum for a shorter time,

according to section 10 of the royal decree of February 22, 1841 (Reg. Blatt., page 83), besides the defraying of their traveling expenses according to section 4 of the royal decree of June 14, 1875 (Reg. Blatt., page 314), and in case of their remaining abroad over night, for every night of such absence a reimbursement of 2 marks.

It is reserved to the judgment of the township meetings with the consent of the district government, their superiors, to increase in a proper way the allowances and traveling expenses of the members of the board of inspection in consideration of the special conditions of the district concerned, or to fix certain contributions for them. In the latter case, however, it is left to the individual members of the board of inspection to require, through a declaration to be given covering the whole period of their term of office, that instead of such fixed contributions, the allowances and traveling expenses, according to the provisions of the first section, may each time be granted them.

Farriers, when serving as members, receive, unless by contract some other provisions are agreed upon, the usual allowances and traveling expenses of county farriers according to the existing regulations (decree of the ministry of January 16, 1874, Reg. Blatt., page 83).

The bills for allowances and traveling expenses of members are to be transmitted through the president to the county authorities for auditing and payment from the township corporation funds or out of the moneys deposited in advance.

The cost of blank forms for permits and minutes and of other writing materials, postage, &c., required for the boards of inspection and superior boards of inspection, are likewise to be defrayed through the county authorities and out of the township corporation funds.

27. The township authorities are, even before this law takes effect, to provide that contracts for bull-keeping, not made out in compliance with the provisions of the law and this accompanying decree, be made to do so as soon as possible. New contracts not corresponding with these provisions, and the period of which extends beyond the 1st of May, 1883, are not allowed to remain in force.

The county authorities are to assure themselves that bull-keeping, after the promulgation of this law, is carried on strictly according to its provisions and those of this accompanying decree. At the same time, however, during the period of transition, so far as practicable, and especially in the case of poor townships, regard is to be had as much as possible to local conditions and to the difficulties encountered in changing the existing order of things. Whenever in such cases a departure from compulsory provisions seems necessary, applications are to be addressed to the ministry of the interior.

STUTTGART, *October* 31, 1882.

DOMESTIC ANIMALS IN BAVARIA.

[Report by Consul Harper, of Munich.]

The results of the general counting of cattle stock in Bavaria on the 10th day of January, 1883, are given in the following tables, to which is added, for the purpose of comparison, the results of the counting on the 10th day of January, 1873:

	Year.	Total number of—				
		Horses.	Neat cattle.	Sheep.	Hogs.	Goats.
Cities and towns.						
Upper Bavaria	1883	7,240	7,060	2,811	4,527	517
	1873	6,845	6,829	4,065	4,091	423
Lower Bavaria	1883	2,055	3,466	176	2,449	167
	1873	1,719	3,028	242	2,636	144
Upper Palatinate	1883	1,040	1,742	86	1,500	437
	1873	1,016	1,509	101	1,755	357
Upper Franconia	1883	1,758	3,225	430	1,023	897
	1873	1,507	3,457	523	1,161	643
Middle Franconia	1883	4,550	5,983	3,939	4,873	1,993
	1873	3,760	5,750	4,874	3,837	1,700
Lower Franconia	1883	2,068	2,528	1,648	1,798	1,162
	1873	1,851	2,432	1,535	1,591	819
Suabia	1883	4,788	6,928	9,818	3,385	734
	1873	3,934	6,733	12,877	3,076	567
Total	1883	23,519	30,932	18,908	19,555	5,907
	1873	20,632	29,798	24,217	18,147	4,052
County districts.						
Upper Bavaria	1883	104,110	608,314	244,980	137,123	11,787
	1873	104,374	618,836	200,394	104,504	12,273
Lower Bavaria	1883	31,086	518,161	154,809	191,194	15,498
	1873	72,268	509,783	202,262	152,856	17,400
Palatinate	1883	33,869	217,699	37,469	72,535	39,724
	1873	34,064	221,834	33,957	56,922	34,502
Upper Palatinate	1883	16,013	344,509	112,814	131,599	15,955
	1873	15,934	345,701	129,618	123,685	14,164
Upper Franconia	1883	6,450	259,244	78,027	76,343	39,459
	1873	6,201	275,552	105,115	68,910	34,224
Middle Franconia	1883	25,284	294,505	211,889	189,879	34,552
	1873	24,499	291,847	219,226	120,450	31,155
Lower Franconia	1883	16,765	289,913	143,962	160,652	48,550
	1873	17,441	294,575	150,588	145,296	37,981
Suabia	1883	54,992	461,649	175,336	103,453	8,172
	1873	55,454	478,825	186,813	81,328	7,520
Total	1883	338,569	2,993,994	1,159,286	1,071,778	213,677
	1873	330,235	3,036,453	1,317,973	853,951	189,229

RECAPITULATION.

Upper Bavaria	1883	111,350	615,374	247,791	141,650	12,304
	1873	111,219	625,665	204,459	108,595	12,695
Lower Bavaria	1883	33,141	521,627	154,985	193,643	15,665
	1873	73,987	512,811	202,504	155,492	17,544
Palatinate	1883	33,869	217,699	37,469	72,535	39,724
	1873	34,064	221,834	33,957	56,922	34,502
Upper Palatinate	1883	17,053	346,251	112,900	133,099	16,392
	1873	16,950	347,270	129,719	125,440	14,521
Upper Franconia	1883	8,208	262,469	78,457	77,366	40,356
	1873	7,708	279,009	105,638	70,071	34,867
Middle Franconia	1883	29,834	300,488	215,828	194,752	36,525
	1873	28,259	297,597	224,100	124,287	32,855
Lower Franconia	1883	18,853	292,441	145,610	171,450	49,712
	1873	19,292	297,007	152,123	146,887	38,800
Suabia	1883	59,780	468,577	185,154	106,838	8,906
	1873	59,388	485,058	199,690	84,404	8,087
Total	1883	362,068	3,024,926	1,178,194	1,091,333	219,584
	1873	350,867	3,066,251	1,342,190	872,098	193,881

A glance at this table shows that the number of neat cattle decreased somewhat; the number of sheep considerably; the number of horses has increased a trifle; the number of goats has also increased, and the increase in the number of hogs is an important one.

The following table shows the relative comparison of the extent and character of the change in numbers of stock, and the per centual increase and decrease in 1883 as against 1873:

	Horses.	Neat cattle.	Sheep.	Hogs.	Goats.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Upper Bavaria	+ 0.1	—1.6	—15	+30	— 3
Lower Bavaria	+12.4	+1.7	—23	+25	—11
Palatinate	— 0.6	—1.9	+10	+27	+15
Upper Palatinate	+ 0.6	—0.3	—13	+ 6	+13
Upper Franconia	+ 6.5	—5.9	—25	+14	+16
Middle Franconia	+ 5.6	+1.0	— 4	+57	+11
Lower Franconia	— 2.3	—1.5	— 4	+17	+28
Suabia	+ 0.5	—3.4	— 7	+27	+10
Kingdom	+ 3.2	—1.3	—12	+25	+13

This comparison shows that horses decreased only in Lower Franconia 2.3 per cent., and in the Palatinate one-half of 1 per cent., whereas the number increased in the districts of Upper Bavaria, Upper Palatinate, and Suabia from one-tenth to one-half of 1 per cent., and in Middle Franconia and Upper Franconia 5½ to 6½ per cent. The increase in the whole Kingdom amounted to 3 per cent.

The number of neat cattle increased in Lower Bavaria 1 per cent., and in Middle Franconia 1 per cent., whereas there was a moderate decrease in the other districts, amounting in Suabia to over 3 per cent., and in Upper Franconia to nearly 6 per cent. In the whole Kingdom the decrease was a little over 1 per cent.

Sheep have decreased everywhere except in the Palatinate, where the increase was 10 per cent. The decrease in Upper Franconia and Lower Bavaria was 25 per cent., in Upper Bavaria 15 per cent., in Upper Palatinate 13 per cent., and in the other districts from 4 per cent. to 7 per cent. In the whole Kingdom the decrease reached 12 per cent.

The increase in the number of hogs is large in all the districts, amounting in Middle Franconia to 57 per cent., in Upper Bavaria, Palatinate, Suabia, and Lower Bavaria, 25 to 30 per cent.; in Upper Franconia and Lower Franconia, 14 to 17 per cent.; Upper Palatinate, 6 per cent. In the whole Kingdom the increase was 25 per cent.

The number of goats was augmented in all the districts except Upper Bavaria and Lower Bavaria, where the decrease was 3 per cent. and 4 per cent. The increase in Lower Franconia was 28 per cent., and in the other districts from 10 per cent. to 16 per cent. The increase for the whole Kingdom amounted to 13 per cent.

The decrease in neat cattle has been more than compensated by the improvement of stock in breed, size, and value, and the farmers prefer to keep fewer and better stock.

The decrease in sheep is partly owing to the low price of wool, the changing of pasture into arable land, and similar causes.

The rapid increase in hogs is due to a larger consumption and high prices.

The increase in goats may be attributed to the fact that marriage and the establishment of a household is now more easy, and the working people keep one or more goats for milk, as it is not necessary for them to possess land for their nourishment.

Population of the Kingdom of Bavaria, about 5,000,000.

JOSEPH W. HARPER, *Consul.*

UNITED STATES CONSULATE,
Munich, May 12, 1883.

SHEEP AND HOGS IN THE UNITED KINGDOM.

REPORT BY CONSUL-GENERAL MERRITT.

Supplementary to my report on cattle-breeding, I beg to transmit the following notes on the different breeds of sheep and pigs of this country.

BREEDS OF SHEEP.

With the exception of the mountain breeds British sheep have changed during the past century even more than British cattle. In reviewing the several breeds as they exist at the present time I will commence with

The Cotswold.—This breed may be described as possessing the following characteristics:

"The frames are large, and when fatted are surprisingly wide and flat on the back. The hind quarter and thighs are full, and the rumps frequently overhang. The chests are very prominent and wide. The face is white, and the countenance fine. They carry a heavy fleece of beautifully curled white wool, long in staple, and of a lustrous character, used for "combing," and generally for the same purposes as that of the Oxfords. They are excellent for crossing with other kinds."

The Cotswold breed can no doubt make good its claim to antiquity far better than most other breeds, and it is generally thought that the Cotswold range of hills owes its name to the sheep cotes once to be found upon them. These sheep have finer forms than any other variety in the Kingdom, being very long and broad over the back and shoulders, while their height makes them appear more imposing than would otherwise be the case. Cotswolds have been so much improved in symmetry and in disposition to fatten during the present century that there is a general opinion that some infusion of Leicester blood took place in Bakewell's day or soon after. Hoggets, under liberal management, feed to carcasses of from 90 to 100 pounds when from eleven to twelve months old. Draft ewes are sometimes fed to great weights, and Mr. John Coleman has stated that he has known instances of their reaching 70 pounds per quarter dead weight. The wool of a Cotswold flock averages about 9 pounds per fleece; hogget clipping, 14 or 15 pounds. The native home of the breed was the neighborhood of the Cotswold hills in Gloucestershire. Afterwards they extended themselves very much into the neighboring counties, especially Oxfordshire, Worcester, and Hereford, and also into Monmouthshire and South Wales. The modern breed of Oxfordshire Downs has now very much supplanted this breed in certain districts, but there are yet excellent ram-breeding flocks in Gloucestershire and Oxfordshire, and also in Norfolk.

In reference to the Cotswold breed the accompanying notes (inclosure No. 1*) have been received from Mr. H. I. Elwes, of Colesborne Park, Cheltenham, Gloucestershire, in which he alludes to the origin of the breed, its characteristics, the climate of the locality, nature of soil, &c. This valuable and hardy breed of sheep, it may be noted, possesses great merits in respect to importation as apart from the value of their meat and wool. The excellence of the cross between Cotswold and Merino sheep is acknowledged. Breeders of the Oxfordshire Down, of the Hampshire Down, and of the Shropshire Down, respectively, claim the favor of importers, and these as well as the Cotswolds, the Suffolk, the Lincoln, and the South Down, have great merits that make a choice between them difficult. The Cotswold claims the long descent of three hundred years. Next to the Lincoln sheep in size the Cotswold bears wool weighing 10 pounds to the fleece; in special instances 24 pounds; and the staple is long, very strong and durable, suitable for fabrics for rough wear.

The cross produced between Merinos and Cotswold sheep is heavier at a year old than is a pure-bred Merino at two years. Experiments made by Sir John Lawes credit the Cotswold breed as making a greater and quicker return for its food than does any other breed which he has compared with them. Lamb rams are used for breeding at eight months old. The Cotswold sheep bears cold successfully in the English climate all the year round. From 500 ewes, the produce of Mr. Elwes's flock is 600 to 650 lambs, counted when weaned. The death rate varies from 2½ to 7 per cent. of the whole flock of ewes and lambs. In commenting on the adaptability of the Cotswold sheep to other districts, Norfolk, South Wales, and other parts, Mr. Elwes states that the breed changes character more or less when removed from its native hills. This may well be a fact, and yet many of the Norfolk Cotswolds have carried away prizes when compet-

*The inclosures referred herein by the consul-general will be found in their regular order immediately after his report.

ing with specimens from Gloucestershire, a result that might, however, happen from the superior grazing qualities of the Norfolk pasture.

The Leicester.—The Leicester breed may be described as follows:

"The head and ears are covered with short white hair. Some are rather bald on the forehead, but this is generally caused by their having been housed. The ears are long and thin; the eyes full and quick; the chest deep and wide; the back broad and straight; the bone fine."

This breed generally takes the foremost position among long-wool varieties. Owing to the magical change wrought by Bakewell in them they became towards the close of the last century the model sheep of England, and the means of transforming well-nigh all the long-wooled breeds in the Kingdom by bringing about better quality and more symmetrical proportions. At the present day really pure-bred Leicesters are somewhat limited, many of the Yorkshire flocks being crosses with the Wensleydale to increase the size and make the flock a better rent-paying one, although the blood is less pure than that to be found in the midland counties. In Scotland and the North of England "Border Leicesters" are in great favor. They are a much less symmetrical and far stronger boned breed than the Leicesters proper, but yield heavier weights, both of mutton and wool, and are far more profitable. Leicesters do not get so weighty as sheep of the Cotswold or Lincoln breed owing to their smallness of bone, nor are they extraordinary wool bearers, 7 to 8 pounds per fleece being a good average. Their wool is not so valuable as formerly now that Australia sends to England the best quality of merino adapted to finer kinds of fabrics. It is, however, the best of the long-stapled, bright, coarse wools, and is used for making the best quality of luster yarns. The weight of wethers from fifteen to eighteen months old is usually from 20 to 22 pounds per quarter.

The Lincolns.—The Lincoln, like the Leicester breed, is an old one very much transformed by modern art. The old Lincolnshire was a gaunt, big-boned animal, capable of feeding to an enormous weight, but taking a long time to accomplish it. By a prodigal infusion of Leicester blood the modern Lincoln has been made pre-eminently wealthy in both mutton and wool, with a predisposition to fatten scarcely excelled by any other long-wooled variety. Lincolns are best adapted to the fens of their native country, and very high class flocks of the breed are likewise to be found in Notts and Yorkshire. The type of Lincoln sheep to be found in the latter country is, however, much crossed with Leicesters. Wether hoggets feed to about 25 pounds per quarter. Being very broad, deep, and compact in form they generally outstrip the Cotswold in weight at the Smithfield Club shows, and last December the heaviest pen * of sheep in the agricultural hall was that of Mr. John Pears, which took the first prize in the ewe class, the animals weighing 9 cwt. 2 quarters 24 pounds. There was, however, a heavier pen of wethers in the Cotswold department than in the Lincoln, Messrs. Gillett's weighing 8 cwt. 6 pounds, whereas the heaviest Lincoln pen of wethers belonging to Mr. Robert Wright weighed 7 cwt. 3 quarters 8 pounds.

As wool bearers Lincoln sheep excel all others. The fleeces average from 12 to 15 pounds for ewes and wethers and 18 to 24 pounds for rams. They have hardy and good constitutions, they thrive on bad clayey soils and where the land is wet. Their hardiness recommends them for increased cultivation. In regard to Lincoln sheep, Mr. Mackinder, of Lincoln, sends a record (inclosure No. 2) of his nine-months old lambs weighing 14 stone, and ewes three years old 26 stone, live weight. The sheep are not housed in winter, and their wool, when washed, weighs 10 to 30 pounds.

The Devon Long-Wool.—This is a breed of long-wooled sheep much valued in Devon and West Somerset. It is the result of a cross of Leicester with an old local breed called the Bampton. The sheep are longer and stand higher on their legs than the Leicesters, in which respect they somewhat resemble Border Leicesters, but are much finer in bone than the latter. The carcasses of wether hoggets when a year old range from 21 to 24 pounds per quarter. The districts where they are found in the greatest perfection are about Tiverton and throughout North Devon generally, also in the Taunton and Willeton vales of Somerset. There are two other long-wooled breeds to be found in Devon, but chiefly in the southern part of that county. These are the South Hams and Dartmoor varieties.

The former are considered excellent rent-payers, and yield fleeces almost as heavy as those of the Lincolns. They likewise feed to tolerably heavy weights, yet are far coarser in bone and less symmetrical than the North Devon. The Dartmoors are giants, and in case of crosses on the old mountain Dartmoor by South Ham rams the fleeces are heavy, but most remarkably coarse and long. The carcasses of the sheep are very weighty, but they are considered to take a long time to fatten. The locality where they are found is around Tavislock or on the slopes of the Dartmoor mountains.

The Kentish or Romney Marsh.—The Kentish or Romney Marsh sheep are gaunt, and very strong in bone, muscle, and wool. The Kent Marshes are very much exposed to

* The word "pen" signifies 3 animals of a kind taken collectively.

channel blasts, so that breeders dare not improve them overmuch, but in some parts of Kent the breed is to be met with divested very much of the coarseness so objectionable in the eyes of strangers. The fleece is heavy and long, and possesses fineness of fiber, good luster, and a curl in the staple which gives it the "spring" which is so much prized. Its special feature is its good spinning properties.

It is also used for mixing with mohair. Their flesh is of better quality than that of most other long-wooled sheep, excepting alone the Dartmoor, and when fattened their carcasses weigh from 25 to 30 pounds per quarter. As a proof that they are capable of early maturity, the first prize pen of lambs of Mr. H. Page, of Walmer, weighed 4 cwt. 3 quarters 4 pounds, which far excelled that made by the heaviest pen of Leicester lambs, to wit: 3 cwt. 2 quarters 10 pounds, although the latter were two weeks older.

The Roscommon.—The Roscommon breed is a celebrated long-wool variety in Ireland which now rivals in usefulness most of the English breeds of a similar kind, and as the old Roscommon was peculiarly gaunt, big-boned and unshapely, the transformation, by a plentiful infusion of Leicester blood has been truly marvelous. Shearling wethers are usually fed up to from 25 to 30 pounds per quarter, and draft ewes are sometimes fed up to 40 pounds per quarter. The fleeces of a flock generally average about 8 pounds each. The wool is soft, deep-grown and rich. The breed is not only to be found in the county giving its name, but also in West Meath and Limerick. There is in the North of England a long-wooled breed called the Westmoreland, and in Yorkshire another of a somewhat similar kind called the Wensleydale. Both are rent-paying sheep and are more hardy than the Leicester with which they have been crossed. At the Derby Royal show a handsome shearling ram of the Westmoreland breed, belonging to Mr. J. Thompson, of Singleton Park, Kendal, took the second prize, in a general class, competing with animals of the Devon long wool and Wensleydale breeds. It was stated that the sheep had clipped 27 pounds of wool the previous April.

The Oxfordshire.—The Oxfordshire breed deserves consideration next, as standing between long-wooled and short-wooled varieties. It is in fact a hybrid derived from Cotswold and Hampshire; but which for many years has, by careful selection, been brought to a tolerably uniform type. The best of the flocks are found in Oxfordshire, Bucks, Beds, and Hants, but the breed is very much extended owing to its wealthy character, and the combination of quality and quantity in the mutton carcass. It has been claimed that weights of carcass exceeding 30 pounds per quarter have often been obtained from wether hoggets a year old, and considering that the flesh is juicy and of equal quality to the Hampshire, it is very much in favor. Mr. John Treadwell, Upper Winchester, Aylesbury, Bucks, writes that from his flock of Oxfordshire Down sheep he lambs 240 ewes, and breeds about 100 shearling rams annually, which he sells at auction in July and August. The average at which they have sold for the past two years has been £23 9s. 6*d.* each. Many went to Germany to cross the Merinos. For thirty years Mr. Treadwell has worked this breed and kept up the pedigree. He claims for it adaptation to all climates, all soils and systems of management, and that the breed improves any other it crosses, especially the Merinos.

The Hampshire or Wiltshire Downs.—The principal district for the Hampshire breeds are South Wilt and North Hants, they being stronger and less refined in the one district than the other. The Hampshires are also bred to a considerable extent in Dorset, Berks, Cambridge, Surrey, Sussex, and Kent.

This breed appears to rival all others in early maturity, a characteristic very much favored in its development by the numerous watery meadows of the chalk district, allowing early lambing and good feeding in early spring.

Mr. William Parsons, of West Stratton, who has a celebrated flock of the Hampshire Downs, says that the Hampshire climate is often bitterly cold in winter, owing to the hilly and exposed position of the country. The subsoil of the sheep district is principally chalk, and much of the land is poor and thin. One of Mr. Parsons's greatest successes in the show yard was scored only last December at the Smithfields Club show, where his pen of sheep were adjudged one of the finest ever exhibited, while a pen of lambs belonging to Mr. W. Newton, of Berks, weighed no less than 6 cwts. 2 quarters 2 pounds at the age of ten months and two weeks. When it is considered that only one of the South Down wethers a year older exceeded this weight, it must be admitted that the early maturity of this breed is most astonishing. The breed is said to have derived its origin by an amalgamation of two old extinct ones, the Wiltshire Horns and Berkshire Notts, and subsequent crosses of South Downs.

The Shropshire.—The Shropshires are traced back to two very old breeds, the Longmynds and the Cannock Chase variety, with an overtopping of the Southdown on the amalgamated race. No native breed has extended so rapidly of late years, having run all over the northwestern part of the kingdom and the Midlands, being met with here and there, also, from Scotland to Cornwall, while there are some exceptionally good flocks in Ireland. Although growing to less weight than the Hampshire and certainly not so

remarkable for early maturity, the quality of the mutton of the Shropshire is superior, and only to be excelled by that of the Southdown.

While the sheep itself has considerable constitutional vigor and is said to bear a damp soil and humid climate, Shropshire hoggets are seldom mature until April or May, when they weigh from 18 to 20 pounds per quarter. The ewes are much more prolific than Hampshires or Southdowns, and often 50 per cent. of doubles has followed liberal management.

The Southdowns.—The Southdown stands ahead of either of the two preceding breeds in respect to purity of blood, there being probably none more so; still it has always been a marked feature of the breed that it is susceptible to varieties of type. This, however, is attributable to change of pastures, not to any cross of blood.

On the fertile grass lands of Norfolk, Berks, and some other counties, Southdowns have increased their size and become much larger than those which have been propagated for countless generations on their native Sussex hills. Southdowns are the pride of most show-yards, but are regarded in few districts nowadays as wealthy tenant farmers, rent-paying sheep. Still no variety of sheep has been more improved in its native county. Originally from 12 to 14 pounds per quarter was considered heavy weight for a two-year-old wether, the fleece having been only 2 pounds in weight. Now the product of wool is about doubled, and the wether hogget feeds to nearly 18 pounds per quarter at eighteen months old.

There are some good flocks of Southdowns in Dorset and Gloucestershire, no less than in their native county, as also in Norfolk, Cambs, and Berks.

Their characteristics are as follows: The bone is small, the body thick and cylindrical, the ears wide apart. Both the ears and forehead are well covered with wool, which forms a protection from fly. The eye is full, bright, and quick; the chest wide, deep, and projecting; the back flat to the tail, which is set on high; the hind legs are very full on the insides and wide apart.

The Southdown, when crossed with long-wooled sheep, produce an animal having a large frame and yielding excellent mutton. The fleece is short, curly, and fine. The wool may be classed amongst the finest qualities, and is the shortest staple wool of Great Britain. It is now used chiefly mixed with Australian wools.

On the subject of Southdowns I transmit with this report two valuable papers as inclosures, first (inclosure No. 3), a paper entitled "Southdown sheep, their history, breeding and management," read by Mr. Henry Woods, of Merton Thetford, before the Institute of Agriculture, at the South Kensington Museum, March, 1884; and second (inclosure No. 4), a paper on Southdowns and Cambridgeshire farming, which gives a succinct history of the celebrated Babraham flock of modern Southdowns.

The Suffolk Downs.—The Suffolk Downs are descended from the old horned Norfolk, crossed by the Southdowns. Although not very symmetrical in form, they are very hardy and useful on the strong lands of Suffolk and poor sands of Norfolk; they are also found in Cambridgeshire. They have black faces and legs, with long donkey ears.

In West Suffolk they have been much improved of late, probably by the impress of Hampshire rams. The Smithfield Club has allowed them a wether and lamb class at the December show, and the lambs have put in a formidable appearance, sufficient to justify a claim that well-managed flocks are not deficient in early maturity. The heaviest pen at the last show was that of Mr. E. Tyson, of Silverley, Newmarket, which at nine months two weeks old scaled 5 cwt. 1 quarter 22 pounds.

The Dorset Horns.—This breed like hilly pastures of moderate elevation, and few other breeds are kept in Western Dorset from Dorchester to Beaminster, and also in continuation of the same district in South Somerset from Yeovil to Crewkerne and Chard. There are some good ram-breeding flocks also on the slopes of Quantock, below Bridgewater. The ewes are remarkably prolific, frequently yielding twins and triplets at a birth, and with good feeding will produce two crops a year. This has been the breed always chiefly depended upon in the production of early lambs. Draft ewes, after having been put to a Southdown ram, are brought to Weyhill fair in October and purchased by Berks and Horne Counties farmers, who prefer to have them lamb down in November and December. The wethers and old ewes, when fattened, make good weights. Mr. Herbert Farthing's twenty-three-months-old wethers at the late Smithfield show scaled 7 cwt. 23 pounds to the pen.

The Cheviots.—The Cheviots derive their name from the Cheviot hills. They are really a mountain breed, but are ill adapted to very high ranges. They may be described as follows: They are prolific and good nurses; they have no horns. The faces are large and white, with no wool on the head. The eyes are lively and prominent; the ears long and well covered with hair; the chest is full. Their thick wool makes them very hardy. The wool is short and of medium quality, but with good spinning qualities. It, however, varies much, and is chiefly used for making a soft yarn.

The breed emanated in Northumberland, but from a limited range along the course of the Tweed they ultimately displaced the black sheep from all the lower Scottish

hills. Originally the carcase weight of Cheviots exceeded seldom 12 to 15 pounds per quarter, but now from 18 to 22 pounds per quarter is frequently obtained. A useful cross for lowland grazing is that of Leicester rams with Cheviot ewes.

The Mountain Sheep.—The mountain sheep of Great Britain are the black-faces of the Scotch Highlands, found in Lanark, Ayr, Dumfries, Peebleshire, Roxburghshire, and Sterlingshire. They are extremely active and hardy, capable of enduring cold and hunger, and thrive on scanty food, having frequently to scratch through the snow to get it. They are good mothers.

They have a shaggy fur and coarse open wool of middle length, or rather long, inclined to curl, but is hempy, and only fit for the coarsest description of manufactures, such as carpets, &c. The face and legs are black. The males have large spiral horns, and the females also are mostly possessed of horns, but smaller. The face is long, the muzzle free from wool, the ears long, and the eyes quick and lively.

The Herdwick.—The Herdwick breed is said to surpass even the black-faces in hardihood. They are propagated in the fells of Cumberland, Westmoreland, and a small portion of Lancashire.

These sheep are very active, and it is difficult to retain them within any inclosure. They will return from almost incredible distances if removed from their native runs. The fleece is thick and matted together. The wool is rather shorter in staple and finer in quality than that of the black-faces.

The Lanks.—This breed originated in the hill ranges of Lancashire and Yorkshire, but have extended themselves to the peaks of Derbyshire on the one side, and through the mountain ranges of the North of England, even to Scotland, on the other. Their faces are picturesque, being streaked black and white, as are also the legs. Their horns are curled and of a yellowish tinge. They often graze almost equally well with the Cheviots. Three-year-old wethers from the Fell, fed on good grass land, weigh about 18 pounds per quarter.

The Exmoor.—The Exmoor is a mountain race, native to West Somerset and North Devon, and belongs to the elevated range, running from Minehead to South Molton, and to the Forest of Exmoor. The wethers run on the hills for three or four years, yielding fleeces which average from 4 to 5 pounds each. The ordinary Exmoors will then fatten to about 15 pounds per quarter; but highly improved flocks are now found in which early maturity has been induced, so that at eighteen months the wethers fatten to 18 pounds per quarter, but these do not of course run on the mountains.

Of all mountain sheep the Exmoors are the most shapely, really forming models with their round barrel-like forms. They are short, thick, compact, and have short legs, horns curling downward and outward, white faces, legs, and fleeces, which are rather long, the wool coming well up to the cheeks. An excellent cross for lowland feeding is that of the Leicesters with the Exmoors.

Welsh Mountaineers.—This is a diminutive breed found quite generally in the elevated ranges. They are a small-horned breed, wild and active, and frequent the highest parts of the mountains, thriving on scanty food, and feeding on alpine aromatic herbs, which, no doubt, are the sources of the fine flavor of Welsh mutton, which is highly prized. Their faces are usually white, but sometimes speckled or gray. Even at four years old the fat wethers seldom yield a carcass of more than 40 pounds; and if a leg of mutton weighs over 4½ pounds it is deemed of doubtful purity.

A cross with the Cheviots has done well on some of the less elevated tracts of Wales. There is a variety of Welsh sheep called the "Radnorshire," which has lately been improved. They are prolific and excellent nurses. They are hardy and capable of enduring mountain storms, while the mutton is fine flavored. This breed is confined very much to the county giving its name, and even there has been much crossed with the Shropshire.

The Wicklow and the Kerry.—These are the mountain breeds of Ireland; the former resembles the Dorset in a remarkable propensity for early fecundity, but are much smaller in size, bearing affinity in this respect to Welsh sheep. The breeding flocks are on the Wicklow Mountains, but farmers in the neighborhood of Dublin buy draft ewes for the production of early fat lambs. The Kerrys, on the other hand, are found in the west of Ireland. Sheep of this breed are larger in size than the Wicklows, but very coarse-boned and unthrifty, taking a long time to mature.

The Shetland.—These sheep are natives of the Shetland and Orkney Islands. Most of them are polled, but some of them have small horns resembling the goat. They are of small size, weighing when fattened only from 7 to 10 pounds per quarter.

BREEDS OF SHEEP AT THE PARIS SHOW.

As regards the exhibition of sheep at the Paris show, 1883-'84, which, amongothers, included a prize group of Southdowns bred in the Nievre, I transmit herewith (inclosure No. 5) a note from H. Kaius Jackson on the different breeds, with his critique upon the same.

WEIGHTS OF SHEEP.

As furnishing a very complete record of the age and weight of sheep of different classes at the Islington show and the average gain per day in pounds of the several animals, as also the comparative daily rate of increase in the classes for lambs and wethers of the different breeds, &c., I forward (inclosure No. 6) some tables on the subject published in the Mark Lane Express, of December 24, 1883.

SHEEP AND MUTTON IN 1883.

A paper, under this heading (inclosure No. 7), taken from the Live Stock Journal Almanack, furnishes a very complete list of prices at which the sheep of the various breeds of the country sold in the markets during the past year.

PORTRAITS OF SHEEP.

Inclosure No. 8 is said to furnish excellent portraits of three noted animals, to wit: An Oxford Down ram, which is considered a fitting illustration of the breed; a three-year-old Lincoln ram, "Hermit," and an Oxford Down ram, "Campsfield," three years and five months old.

II. BREEDS OF PIGS.

The Berkshire.—The Berkshire is a most extensively cultivated and a very valuable breed. The animals are usually rather above the medium size. The prevailing color is black and white, the white generally being on the nose, feet, and end of the tail. Some are, however, almost entirely black. These differences are attributed by some writers to the influence of either Chinese or Neapolitan blood with which they are allied. The Berkshire pig is altogether thoroughly useful in its character, fulfilling in all points the requirements of modern farming. One of its great merits is the large proportion of lean meat to the fat and the distribution of fat and lean when properly fed. As a result of this a given live weight realizes a larger proportion of available meat than any other breed. The late Mr. William Hewes was for many years a most successful breeder of Berkshires, having a favorite sow which on one occasion yielded fifteen pigs in the year, the produce of two litters, for which £150 was realized, the pigs having been sold when quite young at £10 each. This breed is especially adapted for bacon of excellent quality.

The points of the improved Berkshire are as follows: The head is moderately long, the ears somewhat projecting, but not drooping; the skin has a slight tinge of pink; the eyes are large and intelligent; the hind quarters often droop rather too much; the legs are short; the hair is abundant and indicates great hardiness of constitution.

Mr. Joseph Saunders, of Sutton Wimborne, Dorsetshire, whose specialty is pigs, writes (inclosure No. 9) recommending the Berkshire breed as the hardiest. It should be noted that one of this breed took the champion prize at the last Smithfield show. At the age of eight months one week three days its weight was 16 score, or 320 pounds.

Mr. Alfred Ashworth, of Woodham, Chelmsford, bears witness (inclosure No. 10) to the excellence of the Berkshire breed of pigs. As a successful exhibitor and breeder Mr. Ashworth finds a ready demand for his stock for breeding purposes, a fact that may be emphasized as showing the extending demand amongst farmers and others for the best breeds.

The Large White or Yorkshire.—This breed is cultivated principally in the counties of Yorkshire, Lancaster, Lincolnshire, and Leicestershire, and it is probable that it is descended from the old English pig. Mr. Ronaldson, in his prize essay on the breeding of pigs, says:

"There are good grounds for supposing that the old English hog with flop ears was originally the only domestic animal of its kind in the Kingdom. The genuine old English breed was coarse boned, long in limb, narrow in the back, and low shouldered, a form to which the animals were most probably predisposed, from the fact of their having to travel far and work hard for their food, undergoing at the same time considerable privation during the winter."

A great improvement has been effected in this breed by careful selection and greater attention to feeding. It is said that Bakewell was the first to improve the Leicestershire pigs, and this by a process similar to that which proved so successful in the case of the

long-horned cattle and the Leicester sheep, viz, by selection; that is, discarding the large, coarse animals, and selecting such as were more symmetrical and finer boned. It is probable that the first step in the improvement of the Yorkshire was through the improved Leicestershire pigs; certain it is that at one time they were particularly uncultivated, and are described as "of large size, gaunt, greedy, and unthrifty; coarse in the quality of meat, flat-sided, and huge-boned." The present Yorkshires still have some of the characteristics of the original breed, viz, a long head, overhanging and drooping ears, very long bodies, but narrow in proportion to the length. They are therefore flat-sided, and the hind quarters usually droop. They do not come to early maturity, and are therefore usually kept till they attain their full growth. They then attain a large size, and their meat is specially suitable for curing as bacon and ham.

Mr. Sanders Spencer, a breeder of high repute of Holywell Manor, judge in the pig classes at the best English shows, and the honorable secretary to the pig-breeders' association, writes (inclosure No. 11) that the demand for his breed of pigs has been such that he no longer competes at the various shows, private inquiry being sufficient to clear his yards of surplus stock. Mr. Spencer's remarks, after his twenty-five years of experience, are likely to be of special service. He speaks of the "middle white" and "large white" breeds as being far the best of all. The common English pig is a "brute very prolific but ruinous to fatten."

Mr. Joseph Saunders, above referred to, has also found the "large white" breed a very capital one. This breed, I may here record, were notably successful at the international summer exhibition at Hamburg in July last, where the crosses of English pigs with German breeds were a subject of general commendation.

The middle-sized white.—These have no doubt been produced by a cross between the large and small white breeds; they possess many of the good qualities of each breed, and are very useful. They combine aptitude to fatten quickly, having plenty of flesh without coarseness, and hardiness of constitution. They are good breeders, being more prolific than the small white breeds, and they are good mothers. They vary a good deal in characteristics, sometimes approaching the large and sometimes the small varieties, and may be said to be more fitted for bacon than for pork.

As observed by Mr. Sanders Spencer, this is considered one of the best of breeds.

The small white.—This breed differs from the large white in many respects. These animals have very short noses, slightly turned up; their ears are sharp and project forward, and may be termed "prickears." The body is covered with curly white hair, which is usually rather long, but in some cases it is thick and short. This breed, however, is generally rather delicate in constitution, and will not bear exposure. The shoulders are very wide and full, the back straight, the tail is set on high, the legs are deep and square. The bone is fine; the carcass is thick, compact, and very symmetrical. The small white breed possess a wonderful aptitude to fatten, so much so that the eyes often are almost hidden; but there is an undue proportion of fat in comparison with the lean. This breed, however, is extremely useful for crossing with larger and coarser varieties of pigs, and they generally improve the quality. Its early maturity makes it a breed specially adapted for dairy farms and for killing as small "pork."

The Suffolk.—These pigs are of a small black breed, well coated with long, soft hair, the abundance of which indicates that they possess good constitution. The nose is short and slightly turned up, and the ears are short, projecting forward, the shoulders are excellent, the back is straight, the tail is set on high, and the general form is that of a parallelogram and very symmetrical. The skin is not apt to crack, as in some breeds. They possess great aptitude to fatten.

Mr. J. A. Smith, who acted as delegate-judge for the English Royal Agricultural Society at Hamburg, and has taken many prizes, writes (inclosure No. 12), in reference to his breed of Suffolk pigs, and says that the mean temperature at Ipswich, near which town he farms, is fifty degrees; summer temperature, sixty degrees; winter, forty degrees. This indicates a good climate, but the figures can hardly be accepted as exact in respect to the district. They probably refer to a particular season. Attention is directed to Mr. Smith's preference for black over white pigs. He observes that the former stand exposure to the sun's rays when feeding better than the latter.

Dorset.—This is a black breed, showing a great resemblance to the Neapolitan. No doubt it originated from a cross with the Neapolitan and other black breeds. These pigs are deficient in hair; their skin is dark; they are very handsome, thick, wide, and symmetrical, and they possess a great aptitude to fatten. Their ears point forward, their noses and legs are short, and the animals are usually very handsome.

Improved Essex.—There is a great similarity between the Essex and Dorset breeds, both evidently possessing a good deal of the Neapolitan blood. They are black. The Essex have rather longer heads, with straighter noses, somewhat inclined to slate color, and have not much hair. Their aptitude to fatten is excessive. They are extremely handsome in every respect.

Tamworth.—This is a breed whose chief distinguished characteristic is that the color is red. They are very hardy, useful pigs.

Irish.—The native pigs of Ireland are a large kind, with coarse bones, very hardy, and thriving well on scanty food. The ears large, and long, strong hair; some are white, some black and white, and some spotted, but of late they have been very greatly improved by crossing with Berkshire and other varieties, and a large number of useful animals resulted; thus a vast amount of cheap and useful food has been produced.

The foregoing notes on the various breeds of sheep and pigs have been compiled from sketches of the same by the president of the Royal Agricultural Society of England, Sir Brandreth Gibbs, supplemented with information from Mr. Joseph Darby, author of a work on sheep, letters from correspondents, and other trustworthy sources.

As a proper accompaniment to these notes, I beg to transmit (inclosure No. 13) a descriptive volume on the sheep and pigs of Great Britain, of approved value, elegantly bound, and superbly illustrated with types of the several breeds referred to.

The foregoing observations, with inclosures accompanying, on the different breeds of sheep and pigs may be found of service at home.

E. A. MERRITT,
Consul-General.

UNITED STATES CONSULATE-GENERAL,
London, March 25, 1884.

COTSWOLD SHEEP.

REPORT BY H. T. ELWES, COLESBORNE PARK, CHELTENHAM.

[Inclosure No. 1 in Consul-General Merritt's supplementary report.]

This breed is one of the oldest in England, and its origin is lost in obscurity, at any rate the district was a celebrated one for long-wooled sheep three centuries ago, and though in the beginning of this century Leicester rams were used to correct the coarseness of the native breed, there is probably no other in England, except the Southdown, so like in general appearance to its original stock. The Cotswold Hills are a poor, exposed district in the west of England, and though the breed has spread into Norfolk, South Wales, and other parts, yet it changes character more or less when removed from its native hills. These consist mostly of arable land, cold, clayey, and sticky in winter; rain-fall heavy, from 30 to 45 inches; harvest late, never finished before October; land mostly rented at from 5*s.* to 15*s.* per acre. The geological formation is oolite limestone, and this is considered to have much influence in maintaining the true character of the breed. The Cotswold sheep is larger than any other in the world except the Lincoln, which it much resembles in most points, though the wool is not quite so fine on account of the inferiority of the soil and climate.

The size of old rams is often immense. There are several instances on record of sheep weighing from 80 to 90 pounds per quarter, skinned and dressed. The ordinary weight of sheep a year old when they are usually killed is about 150 pounds; but wethers fed by myself have weighed up to 67 pounds per quarter dead weight, at twenty-one months old, and my lambs which took the cup as the best pen of this breed at the Islington show in December, 1883, weighed alive at ten months old 200 to 206 pounds each, and the dead weight was 33 to 34 pounds per quarter, or within a trifle of two-thirds the live weight. The wool averages through a whole flock, including ewes, about 10 pounds per fleece, clean washed, but individual sheep have clipped as much as 24 pounds. It is long and very strong, suitable for any hard-wearing fabrics, especially horse-girths and blankets, and is worth at the present time about 1*s.* per pound, or 1*d.* less than the finest Lincoln or Leicester wool.

The meat is equal to either of these breeds, but inferior to that of Southdowns or Shropshires, having a tendency to produce fat rather than lean meat. In early maturity, hardiness, endurance of cold and wet the Cotswold is far superior to Lincolns or Leicesters, and for crossing with other breeds which are deficient in early maturity and fattening qualities is, perhaps, the most valuable in the world.

All the finest cross-bred sheep in England, notably the Oxford breed, are or have been produced from Hampshire ewes by a Cotswold ram, and it has been proved that the cross between Merino and Cotswolds are heavier at a year old than pure Merinos at two years old, the wool at the same time being much heavier and coarser. Sandy districts or rich low-lying plains do not suit the pure Cotswold sheep; but as they are never sheltered in the winter in their own country they can endure a great deal of cold without

injury, the lambs when quite young being always allowed to run out in the fields with their mothers, and are healthier when so treated than when coddled in sheds.

Grass, clover, and sainfoin are the principal food for these sheep from May till November; hay and turnips in winter, and it has been proved by Mr. Lawes's experiments that Cotswold sheep made a greater and quicker return for their food than any of the other breeds which he tried against them.

Purchasers of Cottswold sheep for export should be careful not to buy very heavy, fat rams got up for show, as these often suffer on a long journey and feel the change of food and climate more than ram lambs or year-old sheep. For crossing with inferior sheep lambs are preferable to older rams, as they are lighter, more active, and cheaper to purchase, and are fully fit for breeding at eight months old. Purchasers in America buying through dealers are usually put off with the inferior or second-rate animals from a good flock and pay for them as much or more as the best would cost if they were bought direct from the breeder. The present value of pure Cotswold rams from a pedigree flock is from 8 to 20 pounds, though much higher prices are paid by ram breeders. Ram lambs can be had at about half the amount. The price of good young ewes is from £4 to £6, and their produce, if properly managed and fed, will pay for the mothers at a year old. My flock usually consists of 500 ewes, which produce annually 600 to 650 lambs, counted when weaned. The death rate from all causes varies from 2½ to 7 per cent. of the whole number kept, including lambs, and the sale is held annually in September.

H. J. ELWES.

COLESBORNE PARK,
Cheltenham, Gloucestershire, January 2, 1884.

LONG-WOOL LINCOLNS.

NOTE BY MR. MACKINDER.

[Inclosure No. 2 in Consul-General Merritt's supplementary report.]

My breed of sheep is Long-wool Lincolns and exhibited at the Smithfield show; lambs, 9 months old (live weight), 14 stones, and ewes, 3 years old, 26 stones. My farm is all arable loam, with limestone subsoil. Sheep in summer pastured on one year's seeds, and in winter on turnips in field; not housed; weight of wool when clipped, from 10 pounds to 30 pounds washed.

JOHN W. MACKINDER,
Mere Hall, Lincoln.

SOUTHDOWN SHEEP—THEIR HISTORY, BREEDING, AND MANAGEMENT.

Lecture delivered by Mr. Henry Wood, of Merton, Thetford, to the Institute of Agriculture, in the Lecture Theater of the South Kensington Museum, in March, 1884, *Lord Walsingham presiding.*

[Inclosure No. 3 in Consul-General Merritt's report; from Bell's Weekly Messenger.]

Mr. Wood said: The Southdown breed of sheep is believed to be indigenous to the Downs of Sussex. It is said by the editor of The Farmer's Dictionary to have existed there before the Conquest. It is, no doubt, one of the purest and most unmixed breeds in Britain. Little seems to have been known about Southdown sheep outside the comparatively limited area in which they were kept until about two hundred years ago, when (as Mr. Thomas Ellman writes) several flocks on the Southdowns appear to have been nearly annihilated by an outbreak of the small-pox disease, which was imported into this country from Holland about that time.

The sheep which the disease spared attracted rather more notice than had previously been bestowed on the breed, but it was not until the latter part of the last century that they came to be much esteemed. It was, in fact, Mr. Arthur Young, who, in one of those useful essays published about 1794, which made his name famous in the agricultural world, first called public attention to Southdown sheep, speaking favorably of their hardy constitution and of the fine quality and flavor of the mutton they produced.

About the same time they were also described by other writers as being speckle-faced, long and thin in the neck, high on the top of the shoulders, slack in the girth, high and narrow on the lion, low at the rump end, with tail set on very low, sharp on the back, flat-ribbed, narrow in the forequarters, and generally, though with little space between their forelegs, showing a fairly good leg of mutton. As a rule they were looked upon as plainly formed, if not ugly sheep, which produced good and fine-flavored flesh. They were small, very small, as compared with the Southdowns of the present day.

To Mr. John Ellman, of Glynde (the father of the late Mr. John Ellman, of Landport, and Mr. Thomas Ellman, late of Beddingham), will most deservedly always belong the credit not only of bringing Southdown sheep into more general notice, but of commencing (about the year 1780) a course of valuable, well-considered, skillful, and successful experiments upon them. These experiments were conducted by him with slow and steady good effect during the long period of more than half a century. In justice to the memory of one who so earned the gratitude of sheep-breeders, not only in this country, but in various parts of the world, I will quote to you his well-founded and practical opinion as to what an improved Southdown sheep should be; and I would impress upon you the desirability of carefully studying those remarks, with which I thoroughly agree, except as to two particulars, which I will point out to you later on.

Mr. John Ellman says*: "The head should be small and hornless; the face speckeled or gray, and neither too long nor too short; the lips thin, and the space between the nose and eyes narrow; the under jaw or chop fine and thin; the ears tolerably wide, and well-covered with wool, and the forehead also, and the whole space between the ears well protected by it, as a defense against the fly; the eyes full and bright, but not prominent; the orbit of the eye (the eye-cap or bone) not too projecting, that it may not form a fatal obstacle in lambing; the neck of a medium length, thin towards the head, but enlarging towards the shoulders, where it should be broad and high, and straight in its whole course above and below; the breast should be wide, deep, and projecting forwards between the fore-legs, indicating a good constitution and a disposition to thrive. Corresponding with this the shoulders should be on a level with the back, and not too wide above; they should bow outwards from the top to the breast, indicating a springing rib beneath and leaving room for it; the ribs coming out horizontally from the spine and extending far backward, and the last rib projecting more than the others; the back flat from the shoulders to the setting on of the tail; the loin broad and flat; the rump long and broad; and the tail set on high and nearly on a level with the spine; the hips wide; the space between them and the last rib on either side as narrow as possible, and the ribs generally presenting a circular form like a barrel; the belly as straight as the back; the legs neither too long nor two short; the forelegs straight from the breast to the foot, not bending in at the knee, and standing far apart both before and behind; the hocks having a direction rather outward, and the twist, or the meeting of the thighs behind, being particularly full; the bones fine, yet having no appearance of weakness, and the legs of a dark color; the belly well defended with wool, and the wool coming down before and behind to the knee and to the hock; the wool short, close, curled, and fine, and free from spiry projecting fibers."

Mr. Ellsman's description of the main points which constituted a symmetrical and well-bred Southdown sheep early in the present century may be accepted as the essential requirements of a good Southdown sheep at the present time, with the two following exceptions, viz, speckled faces and the set-on of the tail. A speckled face is very properly no longer looked upon as denoting a pure-bred Southdown sheep. The face and legs should be of a nice mouse color, neither too dark nor too light, but of medium tint. In fact, anything in the way of a white speck on the face or legs is now considered to show a defect in the purity of the blood. The other point in Mr. Ellman's description of a well-made Southdown sheep with which I cannot agree is the set-on of the tail. Mr. Ellman says the tail should be "set on high, and nearly on a level with the spine." I am of opinion that if a sheep's tail is placed on a level with the spine the position is an unnatural one. I have generally found, too, that when the tail of a sheep has been placed very high the back has been weak and not well covered with flesh. There is a right and wrong position for the tail of a sheep, and to be right it should be neither too high nor too low.

Notwithstanding the great improvement which Mr. Ellman effected in the breed, it was some time before Southdown sheep won their way into public favor, if we may judge of this by the prices which they made. But we must bear in mind that in those days sheep, even of the most esteemed breeds, did not realize high prices. It appears, however, from an article in the Agricultural Annual of that date, that in 1836 there was a considerable increase in the value of Southdown sheep, the breed having become better known, and its merits then more fully recognized. In the year 1787 a Southdown ram fetched for the first time as much as 10 guineas, Mr. Ellman selling two for £21 to Lord

*Farmer's Dictionary, vol. 2, p. 534.

Waldegrave, of Essex. In the previous year Mr. Arthur Young bought eighty ewes of the same gentleman at 18s. a piece. These were sent into Suffolk. In 1789 Mr. Ramsden, of Nottinghamshire, bought forty ewes from the Glynde flock at 25s. each, and Mr. Boys, of Betshanger, in East Kent, gave Mr. Ellman 8 guineas for a ram. The same year Mr. Macro, of Norfolk, acquired from the same flock one hundred and seventy ewes at 23s. a head. In 1790 Mr. Crowe, also of Norfolk, bought of Mr. Ellman forty ewes at 26s. each, and a ram at 12 guineas. In 1791 Mr. Boys gave 31s. 6d. per head for sixty of the Glynde ewes.

From this year I believe we may date the increased introduction of Southdown sheep into Norfolk, under the auspices of that renowned encourager of agricultural improvement and progress, Thomas William Coke (afterwards Earl of Leicester). Mr. Ellman certainly visited Holkham in the year 1790. Having seen the Norfolk breed of sheep, which he considered more remarkable for their activity than anything else, he suggested to Mr. Coke the desirability of a trial of a few Southdown ewes to see how far they would be suited to the soil and climate of Holkham. Mr. Coke assented. As his own sheep were sold, Mr. Ellman bought five hundred ewes and lambs from the best flocks in Sussex, and sent them to Holkham, with four rams from his own flock; Mr. Coke giving as much as 70 guineas for these rams. In 1793 Mr. Coke paid Mr. Ellman 35s. each for eighty ewes, and in 1794 the Earl of Ergemont gave 2 guineas each for fifty of the Glynde ewes. After this Francis, Duke of Bedford, the Duke of Norfolk, and other noblemen and gentlemen, visited Glynde, and were the means of introducing Southdown sheep into different counties. The first ram that ever fetched 50 guineas was sold by Mr. Ellman in 1796 to Mr. Goodenough, of Dorsetshire. From that time, for many years, there was a steady demand for all the rams Mr. Ellman could supply at prices ranging from 20 to 100 guineas each for the season. In 1800 Mr. Ellman disposed of two hundred ewes to the Duke of Bedford for 500 guineas, and in 1802–'3 his grace paid him 300 guineas for the use of a ram for the two seasons, which was the highest letting price ever made by a Glynde ram. The price at which Mr. Ellman sold his draft ewes soon rose to 3 guineas each, and afterwards to 4 guineas, at which price he contracted for the sale of the whole draft to one person (Mr. George Talbot, of Gloucestershire) for four years.

The next person who did much to improve and popularize the Southdown breed of sheep was the late Mr. Jonas Webb, of Babraham, in Cambridgeshire. This eminent sheep-breeder well deserved the respect in which he was held throughout his life. He was a true representative man, of whom his country might well be proud. His name will be remembered for ages to come, and he will be spoken of as one of England's most distinguished breeders and improvers of Southdown sheep. Great was his success as a farmer, and no wonder, for he carried out what he undertook with vigor and "thoroughness."

His connection with Southdown sheep commenced when he was a young man. He entered upon a series of experimental trials with several different breeds of sheep in order to find out which breed was most suited to the Cambridgeshire uplands. At that time Mr. Webb had no particular preference for any one breed, but after exhaustive trials he fully satisfied himself that Southdown sheep produced the greatest weight, and gave the best quality of mutton for the amount of food consumed, and were consequently the most profitable both to breeder and grazier.

These trials determined Mr. Webb to have nothing to do with any other breed of sheep than Southdown. He therefore purchased for the Church Farm, at Babraham, ewes and rams of the late Mr. John Ellman, of Glynde, and other breeders in Sussex. Having started it he gave unremitting attention to his flock, and soon witnessed a gradual but sure improvement in its character. His first letting of rams by public auction took place in 1826. These lettings were continued annually down to the year 1860.

Many will remember the Babraham Ram Lettings, and the annual dinner which followed, with mingled feelings of pleasure and regret; pleasure in thinking over those days, and regret that such meetings are now things of the past. Who can forget the long and gaily-decked wagon-lodge which formed a characteristic banqueting-hall, filled with agriculturists, and among them many leading noblemen and gentlemen, who came not so much to do business as to pay honor to an old friend; who does not remember the late Earl of Hardwicke, with his burly John Bull form and manner, seated at the head of the guests delivering his pithy speeches, replete with humor and happy hits on current topics; who does not recall the jolly, cheerful, Sam Jonas, acting as master of the ceremonies, and his face giving off radiance enough to have lighted up the place without the aid of candles; or the lithe and active John Clayden, who was here, there, and everywhere, with a kind word for everybody; or the host himself in his seat at the bottom table, supported by his friend and opponent in Southdown breeding, William Rigden, and by the tall and spare form of Jem Turner, of Chyngton, one of the best judges of

Southdown sheep that ever lived! Those were indeed meetings, the like of which will never be seen again. But to resume our narrative.

In 1855 a two-year-old ram was let for the season for 170 guineas, and in 1860 a yearling was sold, after being used at Babraham, for 250 guineas. These were, I believe, the highest prices made by Babraham rams. As might be expected, Mr. Webb was a most successful exhibitor of Southdown sheep at the Royal and other agricultural shows. His first prize was won at the Essex show, held at Saffron Walden. He was subsequently awarded prizes for his sheep at exhibitions in Ireland, Scotland, and France. He first exhibited at the Royal Agricultural Society's meeting at Cambridge in 1840, where he received the first prize for ewes. He continued to exhibit with marked success at most of the Royal shows down to and including the Canterbury meeting in 1860, when he made a clean sweep of the prizes for rams.

In 1861 the Babraham ewes and rams were sold by auction. They realized £10,926. In the following year (1862) the shearling rams and ewes born in 1861 were also publicly disposed of, and brought £5,720. Thus the entire Babraham flock fetched the large sum of £16,646. Surviving but a few months the dispersion of his favorite flock, the owner passed away in November of the same year. Such is the history of the Glynde and Babraham Southdown flocks.

Here I would venture to remark that while the owners of the flocks of which I have just spoken were scrupulously careful to maintain the purity of the breed, each aimed at a different type of animal. "Small and good" sheep were clearly Mr. Ellman's aim; Mr. Webb's, "large and good." Believing that large sheep were much the best, and would be the sheep of the future, I need not say how well Mr. Webb succeeded in producing animals of larger frame and greater weight than the Southdowns of Mr. Ellman's day, while at the same time retaining the true type and all the essential points of a pure-bred Southdown sheep.

It is, of course, a recognized fact (or ought to be by every careful breeder of Southdown sheep) that the first and greatest point is to maintain extreme purity; to allow no cross to diminish the inestimable value of purity of blood. The direction in which improvement in Southdown sheep is desirable is uniformity of character, strength of constitution, excellence of wool, development of symmetrical form, mutton-producing properties, smallness of bone as compared with weight of meat, yet not such smallness as to prevent the carrying of an increased amount of flesh.

THE MERTON FLOCK.

I may say that these are the points to which our attention has been always most especially directed in the flock of which I have now had the management for upwards of thirty-six years. It is not for me to say how far we have been successful; indeed, I must ask you to excuse me if, in illustration of my subject, I am in some degree compelled to refer to the Merton flock. I shall do so very briefly, and only when it enables me to trace more clearly the history of progress and improvement than could be done by reference to other flocks with which I am less intimately acquainted.

Following the subject of increase in weight, I find myself obliged to mention the three shearling champion prize Merton wethers of 1870, which averaged a little over 242 pounds each, live weight. This I believe to have been the greatest weight recorded up to that time. Some persons, indeed, at the exhibition thought that the great weight of those sheep suggested that there had been some cross in the breeding. I need scarcely say how utterly groundless was any such suggestion. The same imputation had been before laid to the charge of Jonas Webb. When he succeeded in producing large Southdown sheep of true type, and with as much quality as the small sheep of former times, he, too, was suspected of having recourse to a cross with some other breed, but the suspicion was as unfounded in his case as in ours.

Since the Smithfield Show of 1870 other Merton pens of shearling wethers have been exhibited of nearly the average weight of the champion sheep of that year, and no question as to the purity of their breeding was ever so much as hinted at.

At the late Smithfield Exhibition Lord Walsingham's prize pen reached the unprecedented average for Southdown wethers of 251 pounds. This showed an increased weight of 9 pounds per sheep over the weight of the champion wethers of 1870, to which I just now referred, and of 26 pounds as compared with the weight of the champion wethers in 1882.

I have no intention of trying to make it appear that with the Merton flock more has been accomplished than may be done by other flocks, or of keeping from you those particulars of management to which is due that largeness of frame and excellence of mutton without the infusion of any blood but that of the purest Southdown, to which the Merton sheep have attained.

There are, of course, many excellent pure-bred flocks of Southdown sheep in this country whose history, peculiarities, and merits I am obliged, through stress of time,

to pass over. But standing in the front rank of successful Southdown breeders at the present day we are naturally reminded of the Prince of Wales, the Duke of Richmond, the Earl of Suffolk, Lord Arlington, Sir William Throckmorton, Bart., Messrs. J. J. Colman, M.P., G. and R. Emery, John Ford, Henry Fookes, G. C. Gibson, Hugh Gorringe, H. Humphrey, A. Heasman, J. Hempson, F. M. Jonas, George Jonas, and last, though not least, my excellent friend Henry Webb.

HOW TO FORM A FLOCK—PRACTICAL SUGGESTIONS.

In the formation of a flock of Southdown or any other breed of ewes great care and judgment are, of course, most essential. Uniformity of character, so that the ewes look as much alike "as peas in a peck," should be your first object. If you desire to judge of the general character of a flock of Southdown ewes, and to see if they have, as it were, a family likeness, have them driven a short distance from where you stand and then suddenly wheeled round so that their heads are thrown up and their faces seen at a glance. This will enable you to detect any marked want of uniformity, if there be any. In a word, the ewes should be "matching" to the eye. When drawing ewes and separating them into lots for the rams, you must exercise great judgment in the selection, carefully noting individual formation and peculiarities, so that the ewes in each lot are as much alike as possible, and adapted to the style of ram you intend to put to them.

There is no flock so perfect but some defects will be found in the ewes which require correcting, and, therefore, care should be taken to use a ram which will be likely to improve in the offspring the faulty points observable in the ewes. It must, moreover, be a matter to which the flockmaster gives anxious attention in selecting a ram that in correcting defects in the ewes he does not overlook any faulty points in the ram which may be transmitted through the ewe and thereby create imperfections in the lamb which the mother did not possess.

Only by practice and carefully observing the true principles of breeding is the flockmaster able to make a proper and judicious selection of rams and ewes so as fitly to mate them. I therefore desire to impress upon you, agricultural students, the absolute necessity of your becoming thoroughly and practically acquainted with the good and bad points of sheep, no matter what their breed, remembering that the same care and skillful judgment requisite for the successful management of Southdowns are also required in the management of other flocks.

Each breed has its own marked peculiarities, faults, and merits, which must be well studied and carefully looked after or a man will never become a good and successful sheep-breeder.

BREEDING.

Remember that the breeding of good or bad animals is no game of chance. You might as well expect to breed a superior Shorthorn beast by using an Alderney bull on a first-class Shorthorn cow as to breed a really good Southdown sheep by using an inferior ram on a good Southdown ewe.

If a man desire, and most flockmasters do desire, to breed good and shapely sheep, no matter what their breed may be, he must first endeavor to deserve success by going the right way to work to obtain it. Leave nothing to chance.

Many persons when they have hired a good ram try to get as much out of him as possible, and give him as many ewes as he can be got over. Now, I look upon this as an unwise thing to do. Nature has its limits; and it is far more judicious to limit the number of ewes put to a ram to from 50 to 70. The ewes will thus be seasoned at the proper time, and have strong, healthy, and vigorous lambs. If you overdo a ram and there are many ewes "run over," you will probably breed a number of weakly lambs; to say nothing as to the bad effect upon the ram for the following season.

I may observe that I by no means recommend what is commonly known as a "teaser" ram to show which ewes are in use. Nature never intended that such a course should be adopted, and I would impress upon you the necessity of following the laws of nature as closely as you can. When a ewe is taken from the teaser to the ram by which she is to be served there is frequently a great deal of nervous excitement and fear produced in the ewe, and this being so how can we wonder if there are many cases of ewes "running over," when they have been subjected to such unnatural treatment, which may be aggravated by the rough conduct of an irritable or bad-tempered shepherd.

PRACTICE AT MERTON.

I feel that I can best explain my views and recommendations if I allow myself once more to say a few words with respect to the system of management adopted in the Merton flock. In doing so I desire it to be clearly understood that though I have been con-

nected for so many years with Southdown sheep, and though I may be said to regard them with all the admiration felt for one's "first love," I am by no means disposed to praise them by depreciating other breeds. A long experience has taught me to recognize the fact that while Southdown sheep are well adapted to upland and dry soils, they are at the same time unsuited to some other soils and conditions. And when pointing out to you the great improvement that has taken place in the breeding of Southdown sheep during the present century, I am not unmindful of the marked change effected in other breeds, such as the Cotswolds, the Lincolns, the Oxfords, the Shropshires, and the Hampshires: and were it not for the invidiousness it would involve, I should like to stray from the immediate subject of my lecture to remind you of the honor which attaches to the names of the many breeders of these sheep, who have earned the thanks of both meat-producers and meat-consumers, but time will not permit this digression.

The Merton flock comprises twelve different families, and the shepherds know, from long experience, how to select the ewes for each family, which ram to put to them, and the kind of lambs that are likely to be produced. By this careful plan of managing the several families we have produced and maintained the large size of the Merton sheep. We have always remarked that when rams have been hired for use at Merton they have only in three instances given us a first-prize animal, but that the second and third generations, after an intermingling of fresh blood with our own sheep, have been most successful.

It is a rule at Merton that when a hired ram has left a promising ram lamb the lamb is used to eight or ten ewes to see how far he may be relied upon for use as a shearling, and thus the disappointment which might arise from his produce not being satisfactory is avoided.

FEEDING.

For ten days or a fortnight before rams are put with the ewes it is advisable to change the food of the ewes to something more stimulating than that which they had been previously fed upon. This not only causes the ewes to come into use more quickly than they would otherwise do, but invariably leads to a better fall of lambs. The fresh food must be continued for at least five or six weeks, when doubtless the greater part of the ewes will be seasoned.

MANAGEMENT OF FLOCK.

During pregnancy great care must be exercised not only in supplying the ewes with nutritious, health-giving food, but in keeping them from any great excitement; such, for instance, as might be produced by fright from being run by a reckless dog. I may here observe that, while fully recognizing the usefulness of a well-trained sheep dog, I cannot but protest against the way in which I have frequently seen in-lamb ewes and other sheep chased, harassed, and alarmed by a wretch of a dog, apparently under the slight control of a careless and lazy shepherd, who, to save his own legs, will unnecessarily run the dog after the sheep, heedless of the ill-effects it may produce. A good and careful man will not dream of doing such a thing. Many persons are little aware of the injury that is done by the injudicious use of dogs. If they are in-lamb ewes there is great risk of producing abortion, and if they are fatting sheep the effect of the alarm caused by an excitable dog upon them is to take a good deal more off in five minutes than you can put on again in five hours. In both cases the owner is a sufferer. The excitement caused by the action of the dog does away for a time with the quietude which is so desirable for fatting animals, and consequently they do not gain flesh so quickly as they would if they were kept free from unnecessary and preventable alarm.

The question what is the best course of feeding for in-lamb ewes is a most important one, and calls for the greatest consideration and care on the part of the flockmaster.

There exists no reasonable doubt that where ewes are kept on grass land until after they have lambed there is little fear of abortion, always presupposing that they are kept free from injury, are not jumped over ditches and water-courses, are not over-driven, nor subjected to fright, &c. I have proved beyond question, with the Merton ewes, that keeping them entirely away from turnips until after they have lambed is a decided safeguard against abortion. Up to the year 1853 the Merton ewes were folded on turnips from the end of October until the spring of the following year. They were then as unhealthy as any ewes in the country. In the early part of 1854 there were something like 110 cases of abortion, and 80 ewes died.. Feeling that a change in the treatment must be made, I determined that in the future the ewes should not be fed on turnips (except for five or six weeks when the rams were with them) until after they had lambed. Since that time they have been folded and fed on grass land, with the supply of grass daily supplemented by a reasonable allowance of a mixture of hay chaff and fresh-made broad bran, at the rate of four bushels of chaff to one of bran. At about the fifteenth week of

gestation half a bushel more bran is added to each four bushels of chaff, and this allowance of mixed food is gradually increased in proportion to the increasing demand made by the unborn lamb on the system and strength of the ewe.

HOW TO AVERT ABORTION.

Since the introduction of this change in our system of feeding the in-lamb ewes at Merton cases of abortion have been unknown, and the mortality among the ewes has been at a minimum. On this point I may be permitted to call your attention to my lecture on "Abortion and Mortality among Ewes," delivered in 1877. To enable me to arrive at something like a definite idea as to the cause of the fearfully large number of ewes which aborted and died in many parts of the country in the early part of the year I have referred to, I sent out more than four hundred circular letters of inquiry, each letter containing twenty questions, to flockmasters and others throughout the United Kingdom. These letters were almost all replied to, and the questions fully answered. They showed clearly and conclusively that the greater part of the abortions and deaths occurred in flocks where the ewes had been fed on a comparatively unstinted allowance of common turnips and swedes unmixed with dry food, and that a good allowance of dry food undoubtedly does away with many of the ill effects produced by simple root diet. It was also very clearly shown that where the ewes were grass-fed there was an entire absence of any serious amount of abortion and mortality. The particulars, with the reasons given for the conclusions at which I arrived, were fully detailed in the lecture to which I have alluded. I may, therefore, especially as our time is so limited, be excused from entering further into this subject. Let me, however, add that I have every hope, when the ensilaging of green crops comes to be fully understood and appreciated as it deserves, the system will be far more generally adopted, with as much benefit and advantage to flockmasters as to dairy farmers, cheese-makers, and stock-keepers in general. I am justified in this confident statement by my recent experience of the good results which have followed the use of ensilage in the case of in-lamb ewes. These results will be given to the public in the lecture which I hope to have the honor of delivering in this room on the 17th of March, on which occasion his Royal Highness the Prince of Wales has, with gracious condescension, expressed his willingness to preside.

LAMBING.

As the time draws near for ewes to lamb, a sheltered, well-littered yard should be provided. This should be surrounded by straw-thatched sheds, so divided as to have a nice comfortable pen for each ewe when she lambs. These yards may be constructed for a comparatively small expenditure, and the cost will be amply compensated by the saving of life both among ewes and lambs; many that would otherwise probably be lost in severe weather being preserved by means of this timely protection. Suitable food and dry litter should also be provided close at hand, so that the shepherd has not to run about in search of these necessaries at a time when the ewes are calling for all the attention which he can give them.

Bear in mind that the duties of a shepherd at lambing time are varied, trying, and anxious, and it is a "penuywise" practice to stint him. To deny him a fair and reasonable amount of manual help when he requires it will be hard upon him, and may be the cause of the death of many lambs; because, however willing he is, there is a limit to the shepherd's bodily power, besides which he cannot be in two or three places at the same time. A careful, painstaking shepherd, of the greatest value at any time, becomes doubly valuable at the laborious and anxious time of lambing. How considerable is the importance and worth of such a shepherd can only be fully understood and appreciated by those who, like myself, have watched his constant zeal and anxiety in endeavoring to do the best in his power for the interest of his employer. I repeat what I said on a former occasion, that it is very desirable for the master to visit his shepherd at the lambing-fold during the night as well as during the day, as frequently as possible, and especially in coarse weather, and if he occasionally takes with him something "warm and comforting" it will be gratefully received and fully appreciated. The more trustworthy the shepherd the better pleased he is to find the master taking an interest in his work. If everything is going on satisfactorily it will afford him pleasure to make it known to his employer, while on the other hand, if he is experiencing more than ordinary anxiety and difficulty in performing his duties, he will be very thankful for the advice and assistance that his master will be able to give him—more especially in cases where the shepherd has reason to put confidence in the skill and knowledge of the master. You therefore see how very necessary it is for you, agricultural students, to be well grounded in all the practical details of sheep management if you would become successful flockmasters, or desire to have your shepherds look up to you for advice.

STRAINING IN EWES AFTER LAMBING.

In a lecture on the "Diseases of sheep," delivered in November, 1872, I referred to most of the diseases to which sheep are liable. On this occasion I can refer to one or two only. There is that fatal disorder, "straining in ewes after lambing," as to which I may say that in the spring of 1878 I made known the success which had followed the treatment of ewes when affected with this disease by the use of carbolized oils, by which an enormous amount of suffering and loss amongst ewes is prevented. Not only did the Merton shepherd save every one of the ewes thus afflicted when we first adopted this treatment, but the flock in the last few years has been entirely free from the disease, which I think is wholly attributable to the free application of the carbolized oils whenever a case of difficult lambing has arisen. Since this treatment was made known by me through the agricultural papers it has been tried by many flockmasters, and with almost unvarying success.

One of the leading physicians of Norwich, and at the present time mayor of that city (Dr. Eade), was so struck with the success of the treatment that he tried it in two out of five severe and dangerous cases of puerperal fever in women. The two patients so treated recovered; the other three died. These cases, most interesting and important (from many points of view), will be found reported in the *British Medical Journal* of January 22, 1881, p. 116, in a paper contributed by Dr. Eade. It would take too much time to enter into the particulars of this fatal disease and the method of its treatment. For information on these points I would refer you to some correspondence on the subject published by the proprietors of the Norwich Mercury, at whose office copies may be obtained. There you will find full directions for the preparation and use of these carbolized oils. The utmost care must be taken in preparing the oils, which should be compounded of the best ingredients. Failure here may lead to failure in result. Indeed, such is the care required in the preparation that (though no doubt there are others) I myself know only of one or two firms in England whose oils are perfectly satisfactory.

TREATMENT OF EWES IN LAMBING.

A few brief general directions as to the management of ewes during lambing time may be of future service to you.

In the first place the shepherd should make it his practice to quietly walk among the ewes, carefully noting those which show symptoms of lambing within a few hours, and gently driving all such into a sheltered fold near the lambing yard, or into the yard itself, so that, whether day or night, he will know where chiefly to direct his attention. When the labor pains come on, and the lamb is believed to be in the right position, the shepherd should not be in a hurry, but allow nature (the best of all midwives) to do her own work. An experienced shepherd will never attempt to help a ewe until he sees that there are signs of her (to use a shepherd's term) "giving up." Then assistance may be rendered with advantage.

The lamb when born should be placed near the head of the mother, who, as a rule, will perform her natural duty. When the ewe has done what is necessary by the lamb, and has somewhat recovered from the fatigue and exhaustion of the labor, she should be sparingly fed; at first with a mixture of good hay, chaff, bran, and crushed heavy oats. Let it ever be remembered that the more judiciously and generously a ewe is fed after having fully recovered from the lambing the better she will be able to nurse the lamb. When the lambs are old enough to pick or nibble a few turnip tops, or a little young grass, they should be allowed to run into a forward fold, where, after a little time, some finely-crushed linseed cake, mixed with crushed heavy oats and a small quantity of fresh bran, should be placed in low, covered troughs, so that they may eat a little of the mixed food at pleasure. This kind of feeding should be continued, increasing the allowance of mixed food as the lambs grow older and stronger. Of course experienced shepherds or flockmasters will understand that it is desirable later on to throw out a few mangolds which the lambs can pick over in the forward fold, the ewes taking what the lambs leave. Perhaps it is unnecessary I should say that it is desirable for the mangolds to be somewhat withered by exposure to the sun and air before they are thus given to the ewes and lambs. I know of no mangold so well suited for early feeding by ewes and lambs as Sutton & Sons' "Yellow Intermediate." We are so satisfied with it that we now grow no other variety. When the time arrives for weaning the lambs, which will be about the 1st of July, preparations should be made to have a supply of coleseed or cabbages, or a similar kind of food, to feed them upon at night, and during the day they should be run out on clean, fresh grass; but on no account allow them to feed on grass growing upon land which may have been fouled by being heavily sheep-fed. Grass growing on such land is pernicious to lambs, and should be carefully avoided. The evil effect may not be observed until much harm has been done. The lambs should have a daily allow-

ance of from three to four ounces per head of mixed bruised heavy oats, linseed cake and fresh broad bran. Where it can be conveniently given, a frequent change of pasture is most desirable, and any extra trouble or inconvenience this may cause will be amply repaid by the thriving and healthy condition that it will be sure to promote. The ewes will require extra care and attention when the lambs are weaned from them. For a few days they should be somewhat sparingly fed, so as to check the production of milk. Each one must also be specially watched to ascertain the condition of its udder, and, when necessary, it should be relieved of any excess of milk by carefully drawing it off with the hand. A neglected udder is frequently followed by milk garget, which is indicated by the udder being swollen and hard. This, though not a fatal, is frequently a very troublesome disease. It arises from the milk curdling, and gives considerable pain and inconvenience to the ewe. The first thing to do is to get all the milk possible from the udder. Then use rather freely a lotion consisting of sugar of lead, ½ ounce; sulphate of zinc, ¼ ounce; vinegar, 1 pint; water, ½ pint. And give a dose of Epsom salts of from 3 to 4 ounces, dissolved with warm water.

Practical flockmasters are also well aware that great care and attention are required in the management of lambs throughout the months of July, August, and September, when so many thousands are annually lost from a low, lingering, weakening fever, which seems to feed on their very life's-blood, *post-mortem* examinations showing that it leaves an emaciated body, white and bloodless. A cure is most difficult, and is rarely accomplished, if the fever remains unchecked for any length of time. Prevention in this, as in other matters, is far easier and therefore better than cure. My experience convinces me that injudicious and niggardly feeling is the main cause of this lamb disease. Where lambs are given a change of food of a nutritive character, and are not allowed to feed on pastures or layers where sheep have been folded or have laid thickly on the ground they generally remain healthy, and are seldom attacked with the fever. "Keep lambs in a thriving condition" is a rule which ought to be written in letters of gold. It is a rule which also applies to sheep of all ages. Time passes so quickly that I have only a few minutes to speak of the management of young sheep when first fed with turnips. I may, however, briefly observe that great care should be taken to gradually accustom the hoggets to turnips by throwing a few at a time on to grass land where they are feeding, increasing the daily allowance as they get accustomed to the food. When this has been accomplished put them into a fold on the turnip land at night; in that case, also, the supply of roots must be limited for a time. When feeding young sheep on turnip land it is of the first importance not to pinch them with insufficient hurdle room. An extra £10 expended in hurdles may save the loss of £20 worth of sheep. A good supply of hurdles enables the animals to get exercise, and to pick up any withered parts of turnips which may have been passed over during the folding. Such withered roots are enjoyed by sheep when the weather is fine, and frequently have a good effect in checking any possible evil from the fresh turnips.

It should be borne in mind that good and successful managers supplement the turnip food with a mixture of chaff (if of hay all the better), malt, culms, bran, and linseed cake, and are guided in the daily allowance by the time at which they wish to have the sheep ready for sale. When the period comes to feed with swedes, in place of white or other common turnips, care must be taken to introduce them mixed at first, and then gradually to increase the proportion of swedes until no turnips are given at all. Do not overdo them with roots at any time, or bad results may follow. It sometimes happens that under any circumstances a lot of sheep will begin to do badly on roots. When this is the case do not hesitate to entirely change the food for a time. It will avoid disastrous loss. I have frequently known a judicious alteration of food cause so great a change in the health of a lot of sheep as to surprise their owner and the shepherd in charge of them. A careful, observant, and practical man will frequently avoid the losses which another person, less observant and less practical, is called upon to endure.

DISCUSSION.

Lord Walsingham, who was warmly cheered, said: Professor Tanner having at the last moment very unexpectedly done me the honor to ask me to take the chair on this occasion, it becomes my duty and gives me great pleasure to propose a vote of thanks to Mr. Woods for his most excellent lecture. I may honestly say that no one has had more opportunity of judging of Mr. Woods's intimate acquaintance with the subject on which he has just spoken than I have myself. I am indebted to him personally for his most excellent management of my flock of Southdown sheep. But apart from that his contributions to agricultural literature are known and valued. I believe that his first lecture, which he gave to the Wayland Agricultural Association thirteen years ago, is still of the greatest possible use to the flockmaster. Mr. Woods has referred in flattering terms to the late Mr. Jonas Webb. I have no doubt that many of you are well acquainted with the statue

of that gentleman which stands in the market-place of Cambridge, and bears testimony to the high reputation in which he was held as an agriculturist and a breeder of sheep. I think we shall all agree that Mr. Webb contributed very much to the improvement of our mutton and wool, and I am quite sure that it will be also your verdict that Mr. Woods has done his duty during his life in contributing to the same satisfactory result.

Professor Tanner: I have great pleasure in supporting the remarks which have fallen from Lord Walsingham. In reference to the lectures of Mr. Woods, which have been published, I am quite sure that they are looked upon as treasures amongst agricultural literature, embodying, as they have done, great personal experience and great personal judgment; and I have no doubt that those of us who will have the pleasure of hearing him on the 17th of March will find that in reference to another subject which is now taking a prominent position in practical agriculture he will be well to the front. I have, therefore, great pleasure in supporting the vote of thanks to Mr. Woods for his very able lecture on this occasion.

Mr. Woods, who was received with renewed cheers, said: I am extremely obliged to the noble lord for another of the very many and great kindnesses which he is always showing me in speaking so flatteringly and kindly of me as he has done this evening. I am very glad to have had the opportunity of making known to you something of the practice of management of Southdown sheep at Merton, and if it proves of any advantage, as I hope it may do, to the students connected with this institute—which from my heart I wish success—I shall be greatly gratified. Let me also say, having had the management of the Merton sheep for such a great number of years, that it would have been a very heavy weight of labor upon my hands if I had not been so thoroughly and practically assisted by the advice of the noble owner of that flock, who, it is a great gratification to me, has attended here to-night to hear what I have had to say about his own property.

Mr. Henry Webb proposed a vote of thanks to Lord Walsingham for presiding, and observed that the noble lord thoroughly deserved the success that he had attained with his celebrated flock.

Mr. Biddell, M. P., seconded the vote of thanks with great pleasure. He said he could not help feeling that agriculturists were greatly indebted to his lordship and to his first-rate agricultural adviser. Where they had great practical talent and scientific attainments, combined with wealth, and the owner of that wealth ever ready to spend it on behalf of agricultural advancement, they could not be too grateful for the advantages they derived therefrom. Speaking from a long experience, he advised young farmers to disabuse their minds of the idea that there was nothing like weight for getting a large price for their sheep. Small sheep would often bring more profit than large sheep, because they would make mutton in proportion to their food much faster, and when it was made the butcher would tell them that it was much more salable than large mutton. He hoped to live to see the day when Southdown flocks would again be the most fashionable.

The noble chairman, in reply, said: I thank you very much for your great kindness towards me, and for the very flattering terms in which the proposer and seconder of this vote of thanks have been good enough to speak of me. I always take the greatest possible interest in all questions relating to agriculture. This is very much owing to my friend, Mr. Woods, for I am afraid without him my interest in agriculture would have been very much handicapped. If I had been called upon to begin a course of farming and get up a flock of sheep at a time when, as in late years, agriculture has not been in the most prosperous condition, I might have disheartened, and said that I would not take much trouble about it; but coming into the property I did, with a flock already established, with able managers in charge of that flock, and with everything in my favor, it was impossible for me not to take the liveliest interest not only in the pursuit of agriculture but also in the flock of sheep which I found upon the Merton estate. With regard to the size of sheep, the point alluded to by Mr. Biddell, I quite agree with him that a small sheep often means more profit to the owner than a large one. Small mutton is, no doubt, in great demand in London, and small sheep will fetch higher prices in proportion to large sheep; but, at the same time, if you can increase size without losing quality, I hold that should be the object which we should have in view.

SOUTHDOWNS AND CAMBRIDGESHIRE FARMING.

[Inclosure No. 4 in Consul-General Merritt's Report—Reprinted from the Field, August 18, 1883.]

The history of the Babraham flock is the history of modern Southdowns; and the Babraham flock originated in this way. The late Mr. Jonas Webb's father was a leading farmer of his day, and when his sons were grown to manhood, and he was getting into years, he spoke to them to this effect: "There ought to be some experiments tried with different kinds of sheep. But that is young men's business. I am too old to begin now; you make the experiments." His son Jonas entered fully into the spirit of the suggestion, and, having hired the Babraham farm, he subsequently began such test trials as suggested themselves to him. Leicesters were the fashionable breed of that day, as was then shown by this breed being first on the list of the classes shown at the Smithfield Club Christmas shows. They still, it need hardly be said, hold this "pride of place" at the London shows to this day. And not only so; for when the Royal Agricultural Society of England was inaugurated at Oxford in 1839, the Leicesters stood first in the list of classes for sheep. They were given the same position at the recent York show.

The young Jonas Webb, of some sixty years ago, displayed at starting the sagacity and judgment which ultimately led to his being the greatest agriculturist of his age. He experimented with Leicesters, Southdowns, and other breeds of sheep, side by side, with a view to ascertain which would produce the most meat and money value per acre. If that was not a stroke of genius at that time, it was the correct way of looking at the question from a practical point of view. Young Jonas Webb evidently clearly understood then, as it is acknowledged by every practical man now, that it does not follow that the greater individual weights at a given age of such large sheep as Lincolns and Cotswolds yield the most profit on the food a farmer may have at his disposal. Nothing will grow out of nothing; and a large, coarse, bony-framed sheep naturally requires more food than smaller and more compact ones. It was this consideration that made the test referred to a question of so much mutton and money per acre. This was before the days of fancy prices, as now given by rich amateur breeders at home and by foreign millionaires. The question then was closely limited to the value of mutton and wool, according to the food consumed, as between the breeder or producer and the butcher or consumer. It is true there were some high figures given for "New Leicesters" of Bakewell about this time; one Leicester ram was let for a thousand guineas to three owners of Leicester ewes. But young Jonas Webb clearly did not heed this and lesser tempting prospects. After the several experiments he instituted and carried out he settled down to the Southdown breed.

Having come to this decision, young Jonas Webb then brought his great natural judgment to bear in improving his flock. The result of his judgment and skill in matching his males and females culminated at the Royal Society's show at Canterbury in 1860, when he took easily the six prizes offered for rams, first, second, and third for shearlings, and first, second, and third in the class for older sheep. A well-executed oil painting of these sheep, with John Day (now of Merton) among them, crook in hand, hangs in the dining-room of Jonas Webb's eldest son, Mr. Henry Webb, of Streetly Hall, near Linton. The artist was the well-known animal painter of his day, Mr. W. H. Davis. Mr. Jonas Webb had resolved not to exhibit his sheep after the Canterbury meeting, and his success there, as above mentioned, was a well-merited finale to a long career of successful breeding and exhibiting.

Not so, however, as an agriculturist. For some years previously Mr. Webb had started a herd of Shorthorns, and at the Battersea show of the Royal in 1862 he sent First Fruits, a white bull calf, which was in the most blooming condition that I had ever seen an animal up to that time. For First Fruits (appropriately named, as this was the first Shorthorn he exhibited) he easily won the first prize. Then in the same year came his lamented death, at the age of sixty-six. But the honors he had won as an agriculturist did not end with his decease, for he had so gained the confidence and respect of all the leading agriculturists of the kingdom that a statue to his memory was subscribed for, and cast. This was the first honor of its kind that was ever conferred for purely agricultural eminence. This statue now stands in the market hall of his native market-town of Cambridge, six miles from Babraham.

These recollections were revived last week by an unlooked-for visit to Streetly Hall, Linton. As Mr. Henry Webb, the eldest son of his celebrated father, has never exhibited his sheep at the Royal and other shows, and as no prominence has been given to them in agricultural journals, I was quite surprised to find the descendants of the original Babraham stock of Southdowns displaying all the purity, good form, fine quality, and good size of their ancestors, with which I was well acquainted twenty-five years ago. The Babraham stock, so far as I have been concerned, had dropped entirely out of sight. Not so, however, with the leading breeders and prize-winners at Royal and other shows, as will be seen shortly.

Mr. Henry Webb hired Streetly Hall (which is about six miles from Babraham) four years before the death of his father. He continued to superintend his father's flock, so far as seeing to his entry of pedigrees and the matching of males and females went, and during this time he had the pick of the best of such sheep and lambs as his father could spare. Then at the sale at Babraham, in 1861, he bought eighty of the aged ewes, the full character of which, both in regard to their breeding capacity and pedigree, he well knew. He also bought eight rams of suitable relationship to the ewes he then purchased and previously possessed at Streetly Hall. It was in this way his present flock was founded, and it may as well be said at once that not a single sheep of other stock has since been introduced to the Babraham flock. This close in-and-in breeding has, of course, required great and good judgment, as well as an intimate knowledge of the complete record of relationship which has been kept. All this has been displayed in a masterly way by Mr. Henry Webb, as evidently by the prolific character and uniform appearance of his present flock.

Streetly Hall, five miles northeast of Linton, is an occupation of 550 acres, 40 acres only of which are pasture. This farm has been in the Webb family for four generations, or upwards of a hundred and fifty years. Its soil is all of a tenacious character, the subsoil being either pure clay or a chalky marl. Some specially skilled management and cropping is therefore required to make it suitable for the health and progress of a large flock of sheep.

The breeding ewes kept number from two hundred and thirty to two hundred and fifty, according as season may vary, or the demand by foreign customers may be more or less. Some aged or barren ewes are drafted from the main flock yearly, and these are replaced by the required number of the best shearlings. As to the health of the sheep, the greatest possible care is taken to avoid contagious diseases. The fences by roadsides are hurdled off, and the gates by roadsides are fenced off by squares or semicircular loops or hurdles, so that the sheep may not come in contact with any passing stock. If sheep or cattle are seen to pass along the road—and the shepherd is always on the lookout for this—the passage along the same road of the Streetly Hall flock is not allowed for at least seven days, no matter what the inconvenience and extra expense may be. This may be looked upon by some stock-keepers as an overdrawn precaution, but this great care is justified by the fact that while diseases have existed in the neighborhood and close at hand, the Streetly Hall flock has never been attacked in any form. As an instance of the healthy and prolific character of this flock—its close consanguinity notwithstanding—every ewe but one that was put to a ram last year had a lamb this spring.

The mode of registering the pedigree of each strain of the flock is to mark the ears of the lambs in a given way before they are weaned. Then the dams—which, of course, have had their ear-marks since they were lambs—are dotted with paint on the near or off shoulder, or on the side or rump, each mark indicating that she was by a certain ram, or had some other close relationship to other rams. These signs are all recorded in the flock-book, and when the time for matching rams and ewes in the autumn arrives, it is to be seen at a glance (by any one like Mr. Henry Webb, who is used to it) which ewes and rams are closely related, and which are further removed in relationship. This skilled and accurate system necessitates the use of eight or ten rams every year for the two hundred and thirty to two hundred and fifty ewes. Sometimes ten ewes of one strain may be suitable for one ram of another strain. In other cases, twenty, thirty, or fifty ewes of other stains may be suitable for other rams. The best rams of particular strains that are suitable for a given number of the ewes of the current flock are valued beyond price; for no consideration would they be sold. An instance of this occurred recently. A Frenchman (one of the leading breeders of Southdowns in France) came over, as usual, to buy, and he showed his good judgment by specially admiring a particular sheep; but he was peremptorily told that he was not for sale, as he was required for so many ewes at home. This, however, did not pacify monsieur, for he went back the next day and said, "I was thinking about No. — all last evening, and dreaming about him all night, and you must let me have him." But, as I have said, a specially good sheep of a given strain is reckoned by Mr. Henry Webb as being beyond price, and he had appointed him for use this year with so many ewes, and no tempting offer could cause him to depart from his resolve. This is how the fine character of the Babraham

stock has been preserved at Streetly Hall. These best sheep, however, are let to other breeders of pure Southdowns, to be delivered at a date when they have done the little work required of them at home. Thus they may be used two or three seasons, or as long as they may be required at Streetly Hall, when they are sold to other breeders, foreign or English.

As an instance of the way this plan has been carried out, it may be mentioned that the first-prize shearling at Canterbury, as represented in the painted group of six above referred to, was used at Babraham in 1860, when he was subsequently sold for 250 guineas to Mr. Thorn, of Thorndale, Washington Hollow, Duchess County, New York. The strain of this sheep is now strongly marked at Streetly Hall. When his stock came out as yearlings, all the leading breeders of Southdowns in England availed themselves of the use of his sons, and a large measure of the fine character of their present flocks is due to the impression made by Archbishop on his issue. The Derby strain (so named after the first-prize shearling at the first Royal meeting at Derby) is another line of sheep that is now conspicuous. There are three grand shearlings of his descent allotted for use at home this year. It was about one of these that the French breeder thought and dreamed so much. The ewes with a paint spot on the off hip are of this Derby strain. This shows the importance of these marks and a record of them. It need hardly be said that the male descendants of Derby will not be matched with the females of that strain, but a ram will be chosen for them which is the furthest removed from that line of descent. It may be that an Archbishop or a Peregrin line may be matched with them. But in this I am only guessing by way of a general illustration, for I could not enter into the complicated and (to me) difficult details of the flock-book, although these entries are A B C to Mr. Henry Webb, who has grown into familiarity with them from boyhood upwards.

The younger animals of this flock are remarkable for their size and uniformity of frame and color. There are one hundred and twenty yearling ewes. Of these seventy will be selected for strengthening the main flock. These seventy, when put together, might be run promiscuously into lots of five or ten each; and he would be a fastidious, not to say an affected judge, who would have confidence enough to declare which was the better pen of the lot, so alike are they in general character. The less perfect fifty will be sold to French, Canadian, American, or other foreign breeders, who are glad to buy at high figures any number that can be spared from the Babraham stock. Frenchmen in particular are eager customers, from the recollection they have of the great success of the late Mr. Jonas Webb at the Paris International Exhibition in 1867.

The rams are eighty, most of which are shearlings. Rams do not grow to so much uniformity of size and general character as ewes do, particularly when a large proportion is left for stock. But, even with this large number, there is the unmistakable family stamp and likeness to be seen in the meanest sheep. There is, besides, a regular and good demand for the smaller and less evenly-balanced rams for crossing purposes, as it is well known that animals are often as much like their aunts and uncles as they are like their parents; and therefore, by the same rule, a comparatively inferior-looking sheep—not forgetting the dictum that "like breeds like"—may be as valuable for ordinary stock purposes as his more perfect relative would be. On this ground Mr. Henry Webb saves the large number indicated of his males, for which he has, as intimated, a regular and good demand. But—and this is not singular, as the renowned character of the Babraham stock causes it to be still resorted to by the principal breeders of Southdowns to keep their flocks up to a high standard—there is more difficulty in bargaining for £10 or £12 rams than for such as run into three figures. English farmers, who breed and feed for a direct profit over the scales, look at an extra shilling per lamb, from an extra cost of £2 or £3 for their sire, with suspicion or distrust; but they overlook the fact that when a pure-bred ram from an old-established flock is put to a flock of common ewes, be they of the same or of a different breed, the issue "shoot out and grow" to a far greater size than they will do if they be issue of common or mongrel parents on both sides. These lesser-priced rams are therefore generally sold to go abroad to France, America, Canada, and other foreign and colonial parts. Their character being so well known and appreciated by the customers of Mr. Henry Webb, all the bargaining now consists in an order by letter for so many at the understood price. Peregrin, I forgot to mention, whose issue are now marked with a paint spot on the near shoulder, was used among a prize-winning flock last year, and he has since been sold at a good figure to a leading French breeder of Southdowns. Hardihood (No. 10), too, is the son of a grand ewe of a favorite lineage, and she is well-woolled down to her jaws and hoofs. Hardihood is by No. 3, a four-year-old of well-preserved form, as he is nearly as straight as a shearling, although his grand character has led to much work being got from him.

The lambs are simply living pictures, both rams and ewes. As the whole crop of each sex is together, there are, of course, variations in form and size. But, as to their general character, there are very few under-sized ones. And as to their family traits, it may be

fairly said they are all alike, "as peas in a bushel are alike." When I just previously mentioned that the dam of Hardihood had wool down to her jaws and hoofs, I did not wish it to be inferred that her fullness of fleece was exceptional; for this characteristic of these descendants of the Babraham stock is general. The lambs, both male and female, are remarkable for the way they are furnished with thick, fine wool over the poll, on the jaws, and down the legs.

Before I make a few notes about the mode of cropping Streetly Hall, I will just mention that I saw the entry in the Babraham catalogue of 1855, of the letting of Young Elegance, the sheep which caused so much discussion among breeders of Shropshires and their critics, from twenty to twenty-five years ago. He was hired in the above year at 131 guineas for use among the Kinver Hill flock, where he was accordingly used. The same year the Duke of Richmond hired a ram—afterward named The Duke—at 170 guineas.

The cropping of Streetly Hall is made subservient, to a great extent, to the large and valuable flock of sheep kept on the farm. The four-course system is mainly pursued. The cereals need not be referred to in this place, further than to say that the green crops and other food prepared for and given to the flock tell greatly on them in a favorable season. This year the spring and summer, so far, having been more favorable than for several past seasons, the crops are generally heavy, and the wheat, oats, and barley have a very fruitful appearance. Some of the wheat-fields have patches of a dark appearance in them; but this is due to the excessive wet in the autumn having killed some of the plants, the said dark appearance being due to the plants having tillered in the spring from having had too much room. Mildew is there apparent, and threatened to be more injurious, owing to recent wet and absence of sun. This is only another instance of the folly of thin seeding, which was talked so much of and written so much about some years ago.

Green crops of almost all kinds are grown for the convenience and support of the flock. Sainfoin is a favorite variety, and it grows freely on the clay which rests on a chalky or marly subsoil. This year, owing to the free growth of tares, ryegrass, and clovers in April and May, several acres of sainfoin have been saved for seed, and from the way the stems are heavily laden, it is expected that eight or nine sacks per acre in the husk will be yielded. Mr. Webb does not approve of the extra labor of "drawing" this seed; that is, of scrubbing off the husk, as he says—which is clearly evident—that it is unnecessary; so he sows it with the husk on, and sells what he has to spare in the same condition.

The swedes, mangolds, and early turnips are grown on ridges a yard apart, that a perfect tilth may be made while the crops are growing, which is clearly, as explained, a necessary point in farming strong land. The plants in the rows are generally left with a short space between them, but this is varied according to the nature of the plants. The later white turnips are sown on the flat, and a Garrett's horse-hoe is used for cleaning them. The Norfolk plan of leaving three white turnips in a bunch, when they are required for late spring feed, is here pursued. This is because they are found to withstand the effect of winter frosts better when three are close together; they, so growing, yield to the swelling of the soil at the time of its being frozen, by rising from the inner or touching side of each turnip, whereby the roots are only slightly stretched, the cellular tissue not being broken, as it is when the swelling soil presses all round a single turnip. Neither mangold nor kohl rabi grow freely on this peculiar clay soil; so the latter are not cultivated, and swedes are sown with the mangold, the latter being drawn out, and the swedes left for feeding on the land. This peculiarity as regards mangold is now evident, for the swedes are strong and well grown, and their bulbs much larger than the bottoms of the mangolds.

A few Prussian blue peas are grown—a dressing of 5 cwt. of blood manure per acre being applied—in the place of roots, as this soil is admirably adapted for them. They are also generally grown to a small extent in the neighborhood. I heard of a case of 9 quarters to the acre having been grown. Mr. Webb's plant was 30 inches long, and very heavily hung with large and full pods. After the peas are harvested, rape and mustard, or late turnips, are sown, according as it may be expected the feed will be more required in the autumn or spring.

Italian ryegrass is sown in wheat for early spring feed. On this mangolds are thrown for the ewes, with a view to make the ryegrass last for the lambs till the clovers are ready. The soil is, of course, greatly increased in fertility by this plan. Turnips are sown afterwards, sometimes on one deep furrow and a scarifying, or after three plowings, according as the season and the other work of the farm may allow.

The flock, in suitable divisions, is now being folded on white clover and lucern. The lambs and ewes are folded on a fine second growth of white or Dutch clover. The ram and ewe lambs are of course divided, they taking the lead in the folds, the ewes following, one day after the male lambs, the next after the females. There is a good supply of last

year's mangolds remaining, and will apparently be for a month. These are yet in excellent condition, and two or three tons a day are thrown into the fold, the lambs eating them freely, and, owing to the ripeness of the roots, they thrive admirably on them, showing no signs of scouring. A large square of compressed white salt is in a box in every fold. Mr. Webb prefers the refined blocks to rock salt, as the sheep take more of it. They certainly nibble it off, or scoop it off in large quantities, with an evident relish. Ensilage in an incipient form, as compared with the knowledge we now have of this practice, has been long in use at Streetly Hall, and it is still continued with the success which has previously attended the system. The sweetest straw of the farm is cut into chaff by one of Maynard's riddling machines, and it is packed in the bay of a barn, mixed with as much cut green tares, clover, or grass as will cause it to heat to the degree of temperature of a well-secured haystack. When the autumn filling of a bay has been consumed, and it is necessary to prepare another supply for spring use before tares, ryegrass, or lucern is fit for the scythe, a small quantity of mangolds is used to generate the required heat for giving a relish to the straw chaff. The layers of this chaff and its fermenting accompaniment are liberally sprinkled with salt while it is being well trodden down by the men who level it.

These points of Mr. Webb's practice clearly seem to be worthy of general consideration.

W. W. G.

The flock of ewes consists of about 300, after about 70 yearlings are put in annually.

H. W.

FRENCH SHEEP.

NOTE BY MR. H. KAINS-JACKSON, OF THE PARIS SHOW, 1883-'84.

[Inclosure No. 5 in Consul-General Merritt's report.]

To most English breeders these would be disappointing, as they formed but a light contingent and ragged regiment in comparison with our Cotswolds, Lincoln, Shropshire, and Downs sheep; whilst their being exhibited out of the wool, and many of the best clothed up like greyhounds, gave a very forlorn appearance to the pens.

The breeds of France are headed by the Merino and mixed Merino varieties, said to be the most widely distributed of any over the globe, and these came direct from Spain at the close of the last century. A good Merino often has wool, fine, soft, and elastic, from the tip of the nose down to the feet. The chief flocks are called after their districts—Soissonnais, Chatillonnais, Beauce, Champagne. Native French breeds crossed by Merino rams have been greatly improved, and are called Métis-Merinos. The cross of our New Leicester or Dishley breed with Merinos has made Dishley-Merinos great favorites in France, especially in the Beauce district and the departments of Berry and Sologne. The French long-wooled breeds are called Artesienne, Normandy, Picardy, Flemish, Saintongeoise, and Vendéenne, and have long legs, long falling ears, thighs and legs devoid of covering, and coarse, long, pointed wool on their backs. All are representative of the Flemish breed, which has the good quality of fattening easily and cheaply. Crossing with the Dishley or New Kent rams, the stock is improved much from its former meagerness.

In the great central sheep-breeding provinces of Berry and Sologne are hardy lowland breeds—the Berrichon and Solognot; but the wool is hard, dry, and scanty—head, belly, thighs, and legs being bare—and the size is often small; the ears are broad and hang backwards, and the whole animal is the antithesis to an English fat sheep. But the flesh is delicate, and the breed fattens well. The Sologne sheep attract notice by their *coffee-colored heads and legs.*

The mountains have local breeds of small size, compact trunk, thick, hornless head, and well-flavored meat. The chief are the Larzac, Lauraquais, Causse, and Segala varieties, and they are found in the southern departments, giving much milk, that is made into cheese. The first named produces the celebrated Roquefort cheese. English Downs sheep have made many cross and valuable varieties in France, and our New Kent and Berrichon have created what is now often spoken of as the distinct Charmoise breed.

At the show held last February, 1884, the prize group of sheep were Southdowns, bred in the Nievre by M. Colus, and the lot of 15 were an excellent group, and would take a good place at an English show, probably gaining second or third prizes. The next breeds that gained notice were the Leicesters (Dishley), Southdown-Berrichons, and pure Berrichons, and Artesiennes. The pure and cross-bred Merinos always occupy front rank. The Oxfordshire Downs cross with the French breeds is much esteemed. In 1883 the prize group was of the Merino breed. French breeds of sheep cannot be recommended for export.

H. KAINS-JACKSON.

WEIGHTS OF SHEEP AT ISLINGTON.

[Inclosure No. 6 in Consul-General Merritt's report. From the Mark Lane Express of December 24, 1884.]

TABLE 1.—*Age in days, weight, and average gain per day of the several animals, taking the classes as they stand in the catalogue, with the exception of those for ewes.*

Description.	No.	Exhibitor's name.	Honors.	Age.	Weight.	Daily gain.
				Days.	*Pounds.*	*Pounds.*
Class 36.—Fat wether sheep of the Leicester breed above 12 and under 24 months old.	215	Mrs. S. P. Herrick		614	242	0.39
	216	....do	Second	614	248	0.40
	217	Executors late B. Painter.	Cup, first	614	255	0.42
	218	....do		614	232	0.38
Class 38.—Fat wether lambs of the Leicester breed under 12 months old.	222	Mrs. S. P. Herrick	First	254	134	0.53
	223	....do		254	131	0.52
	224	Executors late B. Painter.		254	129	0.51
	225	....do	Second	254	122	0.48
Class 39.—Fat wether sheep of the Cotswold breed above 12 and under 24 months old.	226	T. and S. G. Gillett	First	630	292	0.47
	227	....do	Second	644	271	0.42
	228	J. H. Elwes	Third	630	311	0.49
	229	T. R. Hulbert		600	260	0.43
	230	G. W. G. Thomas		630	274	0.43
Class 41.—Fat wether lambs of the Cotswold breed under 12 months old.	234	T. and S. G. Gillett	Second	284	188	0.66
	235	J. H. Elwes	Cup, first	300	201	0.67
	236	T. R. Hulbert		240	149	0.62
	237	G. W. G. Thomas		270	168	0.62
Class 42.—Fat wether sheep of the Lincoln breed above 12 and under 24 months old.	238	Thomas Gunnell		660	277	0.42
	239	Robert Wright	First	630	292	0.46
	240	John Pears	Second	630	280	0.44
Class 44.—Fat wether lambs of the Lincoln breed under 12 months old.	245	Herbert Mackinder	First	270	179	0.66
	246	....do	Second	284	189	0.67
	247	H. M. Kirkham	Third	291	179	0.62
	248	Thomas Gunnell		300	192	0.64
	249	....do		300	173	0.58
	250	A. J. Whitcher		270	172	0.64
Class 45.—Fat wether sheep of the Kentish or Romney Marsh breed above 12 and under 24 months old.	251	Thomas Wotten		607	243	0.40
	252	Henry Page	First	600	264	0.44
	253	....do	Second	600	246	0.41
	254	B. W. Tassell		600	254	0.42
	255	Fred Neame, jr		630	259	0.41
Class 47.—Fat wether lambs of the Kentish or Romney Marsh breed under 12 months old.	259	Henry Page	R	240	160	0.67
	260	....do	Cup, first	240	179	0.75
Class 48.—Fat wether sheep of the Southdown breed above 12 and under 24 months old.	261	H. R. H. Prince of Wales		630	203	0.32
	262	....do		630	213	0.34
	263	Duke of Richmond and Gordon		630	205	0.33
	264	Sir John Kelk		630	221	0.35
	265	Lord Alington		630	214	0.34
	266	....do		630	215	0.34
	267	The executors of H. H. Penfold.	R	630	234	0.37
	268	Lord Walsingham	Cup, first	614	251	0.41
	269	....do	Second	614	220	0.37
	270	Duke of Hamilton		630	208	0.33
	271	Earl of Onslow		644	217	0.34
	272	Lord Braybrook		630	210	0.33
	273	G. C. Carew-Gibson		630	209	0.33
	275	Charles Chapman	Third	600	204	0.34
Class 50.—Fat wether lambs of the Southdown breed under 12 months old.	285	Earl of Suffolk		270	160	0.59
	286	....do	R	270	147	0.54
	287	Henry Upton	Third	307	162	0.52
	288	....do	Second	307	168	0.53
	289	Alfred Heasman		284	151	0.53
	290	....do		284	135	0.48
	291	J. J. Colman, M.P	First	270	131	0.49
	292	William Toop		270	155	0.57
	293	....do		284	158	0.54
Class 51.—Fat wether sheep of the Hampshire or Wiltshire Down breed above 12 and under 24 months old.	294	Sir John Kelk		644	294	0.46
	295	Sir C. M. Sampson	R	644	279	0.43
	297	Alfred Morrison	First	674	319	0.47
	298	....do	Third	660	277	0.42
	299	Henry Lambert	Second	644	298	0.46
Class 53.—Fat wether lambs of the Hampshire or Wiltshire Down Breed under 12 months old.	312	William Newton	R	314	243	0.77
	313	....do		314	199	0.63
	314	William Parsons		284	199	0.70
	315	William Parsons cup and champion.	Plate first	300	214	0.71

TABLE 1.—*Age in days, weight, and average gain per day, &c,*—Continued.

Description.	No.	Exhibitor's name.	Honors.	Age.	Weight.	Daily gain.
Class 53.—Fat wether lambs of the Hampshire or Wiltshire Down Breed under 12 months old—Cont'd.	316	Sir Edward Hulse	Third	284	200	0.70
	317	do	Fourth	291	223	0.77
	318	F. R. Moore		300	695	0.65
	319	Sir C. M. Sampson		291	203	0.70
	320	do		284	177	0.62
	321	John Barton	Second	314	198	0.63
	323	Alfred DeMornay		291	190	0.65
Class 54.—Fat wether sheep of the Suffolk (black-faced) breed above 12 and under 24 months old.	324	Marquis of Bristol	R	674	273	0.41
	325	do		674	269	0.40
	326	Edward Gittus	First	660	301	0.46
	327	Alfred M. Robinson	Second	630	222	0.46
	328	G. Bentinck Robins		630	275	0.44
	329	do		630	246	0.30
	330	Joseph Smith		660	244	0.37
Class 55.—Fat wether lambs of the Suffolk (black-faced) breed under 12 months old.	331	Marquis of Bristol	First	314	159	0.51
	332	Edward Gittus	R	300	172	0.57
	333	Edward Fyson		284	208	0.71
	334	G. Bentinck Robins		300	168	0.56
	335	J. Sturley Nunn		300	187	0.62
	336	Joseph Smith	Second	300	158	0.53
Class 56.—Fat wether sheep of the Shropshire breed above 12 and under 24 months old.	337	Robert Loder, M. P	R	614	256	0.42
	338	Lord Chesham	Cup, first	630	265	0.42
	349	do	Second	630	253	0.40
	340	Duke of Portland	Third	630	232	0.37
	341	Grimwood Cooke		630	190	0.30
Class 58.—Fat wether lambs of the Shropshire breed under 12 months old.	347	Robert Loder, M. P	Second	254	155	0.61
	348	Robert G. Oliver	First	300	153	0.51
	349	do	R	300	150	0.50
Class 59.—Fat wether sheep of the Oxfordshire breed above 12 and under 24 months old.	350	Charles Chappell	Second	607	292	0.48
	351	Albert Brassey	Cup, first	660	302	0.46
	352	do		660	311	0.47
	353	James and F. Howard	Third	630	282	0.45
	354	N. P. Stigoe	R	614	276	0.45
Class 61.—Fat wether lambs of the Oxfordshire breed under 12 months old.	362	Charles Chappell		257	193	0.75
	363	Albert Brassey	R	284	173	0.61
	364	do	Third	284	170	0.60
	366	J. A. Miles	First	284	177	0.62
	367	do	Second	284	176	0.62
Class 62.—Fat wether sheep of the Cheviot breed of any age.	368	Thomas Irving	Second	600	185	0.31
	369	do	First	970	217	0.22
	370	Duke of Sutherland	R	1319	214	0.16
	371	do		1319	197	0.15
Class 63.—Fat wether sheep of any white-faced mountain breed of any age.	372	Lord Poltimore	Cup, first	1365	224	0.16
	373	do	Second	1365	208	0.15
Class 64.—Fat wether sheep of any black-faced or speckled-faced mountain breed of any age.	374	William Gordon		1305	204	0.16
	376	Thomas Irving		940	184	0.20
	377	do	Second	940	193	0.21
	378	Mundell and Wedderspoon.		1385	178	0.13
Class 65.—Fat wether sheep of the Ryeland, Dorset, or any other pure breed not specified in any of the foregoing classes above 12 and not exceeding 24 months old.	380	Herbert Farthing	Cup, first	697	269	0.39
	381	do	Second	697	269	0.39
Class 67.—Fat wether lambs of the Dorset breed under 12 months old.	385	Herbert Farthing	First	337	181	0.54
Class 69.—Cross-bred fat wether sheep above 12 and under 24 months old.	386	Duke of Manchester		638	150	0.24
	387	William Robinson	R	600	258	0.43
	388	do	Second	600	283	0.47
	389	H. V. Sherringham	Cup, first	660	304	0.46
	390	do	Third	660	263	0.40
	391	H. A. Brassey, M. P		644	243	0.38
Class 70.—Cross-bred fat wether lambs under 12 months old.	392	Charles W. Schroeter		270	157	0.58
	393	Edward Burbidge		281	197	0.70
	394	do		278	194	0.70
	395	H. V. Sheringham	First	314	224	0.71
	396	do	Second	314	209	0.67
	397	Thomas Rush	Fourth	300	201	0.67
	398	do	Third	300	207	0.69
	399	William Toop	R	314	180	0.57
	401	John Clowes		281	160	0.65
	402	Francis Minett		300	163	0.54
	403	do		300	193	0.64
	404	Algernon J. Whitcher		291	167	0.57
	405	do		291	179	0.62

TABLE 2.—*Comparative daily rate of increase in the classes for lambs and wethers in the Leicester, Cotswold, Lincoln, Kentish, Southdown, Hampshire Down, Suffolk, Shropshire, Oxfordshire, Dorset, and Cross-bred sheep at Islington.*

Breed.	Number pens of three each.	Average daily gain.	Breed.	Number pens of three each.	Average daily gain.
LAMBS.		*Pound.*	WETHERS.		*Pound.*
Kentish	2	.71	Oxfordshire	5	.46
Hampshire Down	11	.68	Cotswold	5	.45
Cotswold	4	.65	Hampshire Down	5	.45
Crosses	13	.64	Lincoln	3	.44
Oxfordshire	5	.64	Suffolk	7	.42
Lincoln	6	.63	Kentish	5	.42
Suffolk	6	.58	Leicester	4	.40
Dorset	1	.54	Crosses	6	.39
Shropshire	3	.54	Dorset	2	.39
Southdown	9	.53	Shropsire	5	.38
Leicester	4	.51	Southdown	14	.35

TABLE 3.—*Relative position of the lambs and wethers given in Table* 1, *according to the average gain per day in pounds.*

Number.	Description of animal.	Honors.	Age.	Weight.	Daily gain.
			Days.	*Pounds.*	*Pound.*
317	Sir E. Hulse's Hampshire lambs	Fourth	291	223	.77
312	W. Newton's Hampshire lambs	R.	314	243	.77
260	H. Page's Kentish lambs (cup)	First.	240	179	.75
362	C. Chappell's Oxford lambs		257	193	.75
333	E. Fyson's Suffolk lambs		284	203	.71
396	H. Sheringham's Cross-bred lambs	First.	314	224	.71
315	W. Parsons's Hampshire Down lambs (ch. plt.)	First.	300	214	.71
394	E. Burridge's Cross-bred lambs		278	194	.70
393	.....do		281	197	.70
314	W. Parsons's Hampshire lambs		284	199	.70
316	Sir E. Hulse's Hampshire lambs	Third	284	200	.70
319	Sir C. M. Sampson's Hampshire lambs		291	203	.70
398	T. Rush's Cross-bred lambs	Third	300	207	.69
250	H. Page's Kentish lambs	R.	240	160	.67
246	H. Mackinder's Lincoln lambs	Second	284	189	.67
235	J. H. Elwes's Cotswold lambs (cup)	First.	300	201	.67
397	T. Rush's Cross-bred lambs	Fourth	300	201	.67
396	H. Sheringham's Cross-bred lambs	Second	314	209	.67
245	H. Mackinder's Lincoln lambs	First.	270	179	.66
234	T. & S. G. Gillett's Cotswold lambs	Second	284	188	.66
401	J. Clowes's Cross-bred lambs		261	169	.65
323	A. De Mornay's Hampshire lambs		291	190	.65
318	F. R. Moore's Hampshire lambs		300	195	.65
250	A. J. Whitcher's Lincoln lambs		270	172	.64
248	T. Gunnell's Lincoln lambs		300	192	.64
403	F. Minnett's Cross-bred lambs		300	193	.64
313	W. Newton's Hampshire lambs		314	199	.63
321	J. Barton's Hampshire lambs	Second	314	198	.63
236	T. R. Hulbert's Cotswold lambs		240	149	.62
237	G. W. Thomas's Cotswold lambs		270	168	.62
367	J. A. Miles's Oxfordshire lambs	Second	284	176	.62
366	.....do	First.	284	177	.62
320	Sir C. Sampson's Hampshire lambs		284	177	.62
247	H. M. Kirkham's Lincoln lambs	Third	291	179	.62
402	A. Whitcher's Cross-bred lambs		291	179	.62
347	R. Loder's Shropshire lambs	Second	254	155	.61
363	A. Brassey's Oxfordshire lambs	R.	284	173	.61
364	.....do	Third	284	170	.60
285	Earl of Suffolk's Southdown lambs		270	160	.59
332	C. W. Schroeter's Cross-bred lambs		270	157	.58
249	T. Gunnell's Lincoln lambs		300	173	.58
292	W. Toop's Southdown lambs		270	155	.57
404	A. Whitcher's Cross-bred lambs		291	167	.57
332	E. Gittus's Suffolk lambs	R	300	172	.57
399	W. Toop's Cross-bred lambs	R	314	180	.57

TABLE 3.—*Relative position of the lambs and wethers given in Table* 1, *&c.*—Continued.

Number.	Description of animal.	Honors.	Age.	Weight.	Daily gain.
			Days.	*Pounds.*	*Pound.*
334	G. B. Robins's Suffolk lambs	.....	300	168	.56
286	Earl of Suffolk's Southdown lambs	R	270	147	.54
293	W. Toop's Southdown lambs	.....	284	153	.54
402	F. Minett's Cross-bred lambs	.....	300	163	.54
385	H. Farthing's Dorset lambs	First.....	337	181	.54
222	Mrs. S. Herrick's Leicester lambs	First.....	254	134	.53
289	A. Heasman's Southdown lambs	.....	284	151	.53
336	J. Smith's Suffolk lambs	Second ..	300	158	.53
288	H. Upton's Southdown lambs	Second .	307	163	.53
223	Mrs. S. Herrick's Leicester lambs	.....	254	131	.52
335	J. S. Nunn's Suffolk lambs	.....	300	157	.52
287	H. Upton's Southdown lambs	Third...	307	162	.52
224	Executors of B. Painter's Leicester lambs	.....	254	129	.51
348	R. E. Oliver's Shropshire lambs	First.....	300	153	.51
331	Marquis of Bristol's Suffolk lambs	First.....	314	159	.51
349	R. E. Oliver's Shropshire lambs	R	300	150	.50
291	J. J. Colman's Southdown lambs	First.....	270	131	.49
228	J. H. Elwes's Cotswold wethers	Third....	630	311	.49
225	Executors late B. Painter's Leicester lambs	Second ..	254	122	.48
290	A. Heasman's Southdown lambs	.....	284	135	.48
350	C. Chappell's Oxfordshire wethers	Second ..	607	292	.48
388	W. Robinson's Cross-bred wethers	.....	600	283	.47
226	T. & S. G. Gillett's Cotswold wethers	First.....	630	299	.47
352	A. Brassey's Oxfordshire wethers	.....	660	311	.47
297	A. Morrison's Hampshire wethers	First.....	674	319	.47
239	R. Wright's Lincoln wethers	First.....	630	292	.46
327	A. M. Robinson's Suffolk wethers	Second ..	630	292	.46
299	H. Lambert's Hampshire wethers	Second ..	644	298	.46
294	Sir J. Kelke's Hampshire wethers	.....	614	294	.46
389	H. Sheringham's Cross-bred wethers (cup)	First.....	660	304	.46
351	A. Brassey's Oxfordshire wethers (cup)	First.....	660	302	.46
326	E. Gittus's Suffolk wethers	First.....	660	301	.46
354	M. P. Stilgoe's Oxfordshire wethers	R	614	276	.45
353	J. & F. Howard's Oxfordshire wethers	Third....	630	282	.45
252	H. Hage's Kentish wethers	First.....	600	264	.44
328	G. B. Robins's Suffolk wethers	.....	630	275	.44
240	J. Pears's Lincoln wethers	Second ..	630	280	.44
387	W. Robinson's Cross-bred wethers	R	600	258	.43
229	T. R. Halbert's Cotswold wethers	.....	600	260	.43
230	G. W. G. Thomas's Cotswold wethers	.....	630	274	.43
295	Sir C. Dampson's Hampshire wethers	R	644	279	.43
254	B. W. Tasell's Kentish wethers	.....	600	254	.42
217	Executors B. Painter's Leicestershire wethers (cup)	First.....	614	255	.42
331	Marquis of Bristol's Suffolk wethers	.....	614	256	.42
338	Lord Chesham's Shropshire wethers (cup)	First.....	630	265	.42
227	T. & S. Gillett's Cotswold wethers	Second ..	644	271	.42
238	T. Gunnell's Lincoln wethers	.....	660	277	.42
298	A. Morrison's Hampshire wethers	Third....	660	277	.42
253	H. Page's Kentish wethers	Second ..	600	246	.41
268	Lord Walsingham's Southdown wethers (cup)	First.....	614	251	.41
235	F. Neame's Kentish wethers	.....	630	259	.41
324	Marquis of Bristol's Suffolk wethers	R	674	273	.41
231	T. Wootton's Kentish wethers	.....	607	243	.40
216	Mrs. S. P. Herrick's Leicester wethers	Second ..	614	248	.40
339	Lord Chesham's Shropshire wethers	Second ..	630	253	.40
390	H. Sheringham's Cross-bred wethers	Third.....	660	263	.40
325	Marquis of Bristol's Suffolk wethers	.....	674	269	.40
215	Mrs. S. P. Herrick's Leicester wethers	.....	614	242	.39
329	G. B. Robins's Suffolk wethers	.....	630	246	.39
380	H. Farthing's Dorset wethers (cup)	First.....	697	269	.39
381	H. Farthing's Dorset wethers	Second ..	697	269	.39
218	Executors late B. Painter's Leicester wethers	.....	614	232	.38
391	H. A. Brassey's Cross-bred wethers	.....	614	243	.38
269	Lord Walsingham's Southdown wethers	Second ..	614	230	.37
267	Executors of H. Penfold's Southdown wethers	R	630	134	.37
340	Duke of Portland's Shropshire wethers	Third.....	630	232	.37
330	J. Smith's Suffolk wethers	.....	660	244	.37
264	Sir J. Kelke's Southdown wethers	.....	630	221	.35
275	C. Chapman's Southdown wethers	Second ..	600	204	.34
266	Lord Alington's Southdown wethers	.....	630	215	.34
265	.....do.....	.....	630	214	.34
262	Prince of Wales's Southdown wethers	.....	630	213	.34
271	Earl of Onslow's Southdown wethers	.....	614	217	.34
263	Duke of Richmond's Southdown wethers	.....	630	205	.33
270	Duke of Hamilton's Southdown wethers	.....	630	208	.33
272	Lord Braybrook's Southdown wethers	.....	630	210	.33
273	G. C. Carew-Gibson's Southdown wethers	.....	630	209	.33

TABLE 3.—*Relative position of the lambs and wethers given in Table* 1, *&c.*—Continued.

Number.	Description of animal.	Honors.	Age.	Weight.	Daily gain.
			Days.	*Pounds.*	*Pound.*
361	Prince of Wales's Southdown wethers		630	203	.32
368	T. Irving's Cheviot wethers	Second	600	185	.31
341	G. Cooke's Shropshire wethers		630	190	.30
334	Duke of Manchester's Cross-bred wethers		638	150	.24
369	T. Irving's Cheviot wethers	First	970	217	.22
377	T. Irving's Mountain wethers	Second	940	193	.21
376	J. Irving's Mountain wethers		940	184	.23
374	W. Gordon's Mountain wethers (cup)		1305	204	.16
372	Lord Poltimore's Mountain wethers	First	1365	224	.16
370	Duke of Sutherland's Cheviot wethers	R	1319	214	.16
371	do		1319	187	.15
373	Lord Poltimore's Mountain wethers	Second	1365	208	.15
378	Mundell & Wedderspoon's Mountain wethers		1335	173	.13

The above tables have been constructed on the same plan which has been observed in those for cattle. The average gain per day in pounds is calculated to the nearest decimal; that is to say, when the remainder represents a fraction of greater value than one-half it is reckoned as one, and where more than one animal is represented by the same average rate of daily gain relative positions are determined by the numerical value of the remainder. With regard to the tables of averages, it will be seen that the numbers exhibited refer to pens of three, the weights and daily rate increase referring, of course, to an average of the three animals in each pen. The weight of each pen has been divided by three; a remainder of two has been reckoned as one, and a remainder of one has been dropped.

SHEEP AND MUTTON IN 1883.

[From the Live Stock Journal. Inclosure No. 7—Consul-General Merritt's report.]

The past season has been on the whole an average one to the flockmaster. Neither liver-rot nor fluke have disturbed the flock, although foot-and-mouth disease and scab have caused some anxiety. The losses in Lincolnshire and Norfolk were most severe, and caused a drop at some of the sales. The regulations in force to prevent the spread of the disease were ineffective, as the local authorities in some areas granted licenses which were refused in other places; hence discontent and dissatisfaction, encouraged by bad seasons, has produced a wonderful progeny of evils.

In the spring there was quite a stampede. Farmers usually endeavor to have a good crop of early lamb for market, which helps to pay the way at Easter. An embargo, however, was placed on the sale. Her Majesty the Queen issued an order that no lamb would be required for the royal household. This immediately lowered the price of this favorite dainty, and occasioned a serious loss to flockmasters ready to sell. The outcry against the order was so great that another was issued explaining Her Majesty's commands only affected the royal household, and was in no way intended to interfere with the sheep markets.

Doubtless Her Majesty's advisers, looking to the fearful decrease in our flocks of late years, were anxious to retain all the ewe lambs possible for future use. But flockmasters know their business, and can attend to it. They can spot the lambs which ought to be fed for lamb and those which should make mutton. Sheep-breeders have found out that mutton pays better than wool, and that fat lamb brings a better return than mutton. The produce of black-faced short-wooled rams and white-faced long-wooled ewes is found to be a profitable early lamb for the market; and the lamb dropped by Dorset horns is *par excellence* the dainty of early spring. In Scotland early lambs are purposely bred from old ewes, being their last crop of lambs; consequently it pays to feed both with as much artificial food as possible. These old ewes begin to lamb in February, and drop more lambs than ordinary stock ewes, because they are put in good condition when the rams are with them. It would not pay to keep the lambs till they got bigger, as it would increase the bill, and as mutton fetch less. Therefore flock-

masters in both countries try to make as much as possible out of the popular taste for early lamb and green peas.

The prevalence of foot-and-mouth disease and the restrictions in force respecting the movement of cattle contributed to make mutton dear. The trade in store-stock was almost entirely stopped, as the movement orders in some districts were very stringent, and in others quite the reverse. Various representations were made to the Government without any appreciable effect.

At the wool sales in the west of England there was great competition, especially in the month of July. During that month nearly half a million fleeces of Southdown and Dorset-horn wool were sold at the public sales in Wilts, Hants, and Dorset.

One Irish firm spent over £2,000 at one of the Wiltshire sales, and within a fortnight it was estimated that over £30,000 had been spent on Wiltshire wool alone. The general average was a little less than last year, and the competition keen. At Devizes the general range was from 30*s.* 4*d.* to 33*s.* 10*d.* per tod. The figures last year were 33*s.* 10*d.*—the highest price fetched there this year—to 36*s.* 2*d.*, and ten years ago 42*s.* 6*d.* to 47*s.* 6*d.* were the prices realized. The September sales were rather quiet, the best Down fleeces fetching from 14*d.* to 15*d.* and medium from 12*d.* to 13*d.* The tendency of these sales, however, was to favor buyers.

The sales were very successful, if we take them all round. Several of the Down breeds were fancied by German and French connoisseurs, and numerous purchases were made of Oxfordshire, Hampshire, and Shropshire Downs. Time was when there was a great demand from Australia for English sheep and cattle. The policy of closing the ports against all importations, however, prevents Australian breeders visiting or buying in our markets. Our Australian cousins were never afraid of a price, and time was when Messrs. Duddington, of Panton, got a check for 200 guineas for one of the rams of that famous flock. Nowadays the Australians do not come to Old England for their stock, but according to the report of recent sales 3,150 guineas were paid for an improved Lincolnshire ram. These prices have not been reached in England, although it is highly probable that the famous Robert Bakewell, of Dishley, fingered a few guineas, both for his rams and ewes, and also for service. We must, however, take the market as we find it, and therefore direct attention to the fortunes of the various breeds in the sale ring during the season of 1883. Naturally Bakewell's Dishley breed takes the pride of place.

LEICESTERS.

This famous breed owe a great deal of their excellence and popularity to the efforts of Robert Bakewell, of Dishley. It also obtains the foremost place in the royal catalogue, and its popularity is still maintained by breeders, such as Messrs. T. H. Hutchinson, Geo. Turner, Brown, Linton, Jordan, &c. The value of the breed, however, is generally indicated at the autumn sales, which are confined to a few English counties and to Scotland.

At Forres, over 70 rams were offered. Mr. Mackessack, of Cloves, gave the highest price of £20 for a strong well-brought sheep, belonging to Mr. Hunter, of Depple, whose average was £7 higher than last year. At the Muir of Ord fair, Mr. Gorran, of Arabella, sold 40 at an average of £6.

BORDER LEICESTER.

This breed is a great favorite in the north of England, and also in Scotland. At the Edinburgh sales the prices, owing to foot-and-mouth disease, were 25 per cent. below those current at the Lothian sales in 1882. At Kelso, the rams, which were forward in fine condition, numbered 1,867, being an increase of 365 over last year's total. Lord Polwarth's famous Mertoun rams secured the highest price—£125—for a grand ram. From the same flock Lord Arthur Cecil purchased one at £61; the Hon. R. Bailie Hamilton, one at £51; and Mr. Dodds, Cothill, one at £50. The Mertoun average was £26 14*s.* 8*d.* Lord Polwarth also headed the sales last year, when the highest-priced ram made £78. Mr. Thompson, Baillieknowe, got £66 for a ram; the average price being £20 3*s.* Miss Stark, Mellendean, secured £61 for the best lot in her pen, the lot making an average of £18 3*s.* 3*d.*

At Edinburgh, the Craigend rams met with the best demand, and made the highest average, £13 13*s.*, although this was £3 12*s.* 3*d.* less than last year. The highest-priced ram was bought by Mr. Milroy, Torrance, for £30; and Mr. Alexander, Easter Dean, secured the second-prize Lauder ram at £29; Mr. Balfour, of Whittinghame, M. P., obtained the good average of £11 5*s.* 4*d.*, his first-prize Inverness ram being purchased by Mr. Ainsle, Hillend, for £31. The highest price last year was £94 10*s.*, given for a fine ram from the celebrated Oldhamstocks flock. Messrs. Clark, Oldhamstocks, have for fifteen years had the highest average for Border Leicesters, but they had only the third place on this occasion. Their average was £12 5*s.* 1*d.*, as compared with £20 11*s.* 3*d.*

last year; and £30 was the highest figure going, which was paid by the Marquis of Tweedale. The Duke of Buccleuch had an average of £6 2s. 6d., being £5 15s. under last year, and his highest price was £28.

At the Irish ram-breeders' sale, Viscount de Vesci offered twelve rams, which obtained the best average, and the highest price for an individual ram was £31 10s. The Border Leicester is a favorite sheep, and makes capital mutton.

COTSWOLDS.

Cotswolds are greatly favored on the Gloucestershire hills, whence they derive their name, and many breeders in other counties are exceedingly fond of the breed. Mr. Robert Garne, of Oldsworth, obtained the good average of £20 1s. 10d. for an exceedingly even lot; and Mr. C. Mace and Mr. J. Garne had £9 5s. and £9 respectively. But at Hempton Green Mr. T. Brown's celebrated Marham Hall flock met a ready sale at from 8 to 18½ guineas, the sixty averaging £12 16s. Last year Mr. Brown's highest price was 17½ guineas and his average £11 3s. Mr. J. B. Aylmer, of Fincham Hall, made the high average of £12 18s.; the top price last year was 15 guineas. Mr. T. Thornton's shearling rams, bred from the west Dereham flock, fetched from 7 to 19½ guineas. Last year the prices ran from 9 to 19 guineas, and the average £12 6s., as compared with £8 8s. in 1881. Mr. Thomas Allen, of Markshall, offered a number of rams at Horringer fair, which made prices ranging from £9 downwards. At the letting of the West Dereham Long-wools, Hugh Aylmer had a most satisfactory sale. The rams offered were of a fine uniform character, presenting in a high degree that combination of good qualities for which the West Dereham flock is famous. The average for the lambs was £7 10s. 9d., against £5 19s. 6d. last year. The highest price was £15 15s.

LINCOLNS.

This long-wool breed seem to decline in value. Possibly this was due this year to the prevalence of disease and the restrictions in force respecting movement. Time was when a colonial breeder would have given 150 guineas for a ram which last season only fetched about 40 or 50 guineas. The averages made were much lower than those of last year—a fact which the figures we give indicate.

At Biscathorpe, Louth, the late Mr. Thomas Kirkham's flock was disposed of. Sixty-eight rams averaged a trifle over 14 guineas per head. The highest price was 62 guineas. Mr. Edward James Davy (Owersby, near Market Rasen) sold 20 rams. The highest price was given by Mr. J. H. Vessey, 58 guineas. The average was 17 guineas. Mr. Charles Clarke attracted a large company to Ashby-de-la-Launde. A symmetrical shearling was secured by Mr. J. W. Davy, of Owersby, for 37 guineas; a magnificent sheep fell to the bid of Mr. Taylor Sharpe, of Baumber, for 36 guineas. Mr. J. H. Caswell, of Laughton, hired a fine animal for 50 guineas. A remarkable fine three-shear fell to the bid of Mr. J. R. Kirkham, of Cadeby, at 27 guineas. Shearlings averaged £14 15s. 10d. The hundred sheep realized a total of £1,478 18s. 6d., an average of £14 15s 9½d. Last year the average of 100 sheep was £13 5s. 8d. For the rams of the Hultoft flock, the property of Messrs. W. F. and C. Robinson, Mr. J. Robinson, of Anderby, gave 40 guineas. The Ulceby Grange flock, the property of Mr. John Turner, averaged 11 guineas. The higher prices were £25 10s., £24, and £21. Mr. Henry Dudding, of Riby Grange, near Grimsby (late of Panton), sold 30, making an average of nearly £12; Mr. Samuel Grant, Brigg, got one for 21 guineas, and another at £15 (for exportation to New Zealand). The Wootton Dale rams, the property of Mr. Thomas Taylor, Havercroft, averaged nearly £9. Forty rams of the famous Cadeby flock, bred by Mr. John Walesby, Kirkham, averaged £15 10s. per head, one of the best averages obtained in Lincolnshire last season. The highest prices were 54 and 56 guineas. The highest-priced ram belonging to Mr. J. Pears, of Mere, was bought by Mr. H. Smith, of Cropwell Grove, for 50 guineas. Mr. E. Paddison, of Ingleby, obtained an average of £8 10s. 1d. Mr. W. Grimes, of Harmston, made an average of £10 18s. 4¾d. Thirty shearlings, bred by Mr. C. S. Dickenson, of Ashfield House, Branston, averaged £10 7s. 6½d. In Ireland the highest price was 24 guineas, obtained by Mr. R. E. Going, of Nenagh, and his average was £2 over that of last year.

YORKSHIRE OR WENSLEYDALE.

The origin of this breed is somewhat obscure. It is locally termed Wenaleydale, although known in the south of Scotland as the Yorkshire. It has a dash of Leicester blood, and it is through this cross that the blue faces were first introduced. The Wensleydales furnish rams for crossing with blask-faced ewes and Cheviots, the produce being styled "half-breeds" or "Mashams." The rams follow the ewes over the hills,

and the ewes are very prolific, and excellent milkers. The general character of this breed is hardy, with a tendency to accumulate flesh rapidly. The word "Masham" is given to these sheep because a large fair is held

At the annual lamb fair more than 60,000 sheep and lambs were penned; buyers were present in large numbers. Trade was rather slow, but a good business was done. Good-bred rams were in great demand, and found a ready sale at prices varying from £9 to £16; good-bred ram lambs, £3 10s. to £4.

DEVON LONGWOOLS.

These are chiefly confined to Devon, and few sales were recorded. One thing is certain that Sir J. H. Heathcote-Amory still continues to exhibit at the Royal, and that successfully. At the Royal York meeting Sir John entered in the Any Other class and was placed second with an uncommonly neat and good Devon Longwool; he had also the *hc* and *r* for another excellent sheep of the same breed; and he carried off the first prize with the only entry in the Shearling Ewe class. Mr. C. Norris, of Motion, Broadclyst, sold 20 rams for £217 7s. Many of the sheep had taken prizes at the agricultural shows, and were sold in fine condition with heavy fleeces. One ram was let at 18 guineas and another at 15 guineas. The highest price was given by Mr. Bowden for lot 10, and for it he paid 21 guineas. Mr. J. N. Franklin, of Huxham, disposed of 23 rams for £103 9s. The highest figure offered was 15½ guineas by Mr. Gould for the 2-year-old ram which won third at Launceston, and had been *hc* at Cardiff, Torquay, and Reading. The ewes fetched fair prices. The average of Mr. Norris's was 10 guineas, and Mr. Franklin's 9 guineas.

DORSET HORNS.

The Dorset Horn is pre-eminently the sheep which produces the early lamb in spring. This breed had wonderful luck during the past season, no doubt owing to the outcry about early lamb. But the breed is evidently adapted for early maturity, and at the spring market at Croxton Farm, near Dorchester, unprecedently high prices were realized for Dorset Horns. Two-tooth ewes ranged from 75s. to 95s. apiece, whilst the four-tooths made from 69s. to 88s.; six-tooths brought from 70s. to 83s., and the off-going ewes 66s. to 69s.; couples, 98s.; rams, 4 to 5 guineas; and ram lambs, 5½ to 10 guineas per pair. This lot was brought to a high state of perfection by Mr. Cox, this being amply proved by the extraordinary prices obtained, which are still more so, considering the sheep had been previously shorn. That this variety is becoming popular there is no denying, and at the annual sale Mr. T. Ensor, of Dorchester, disposed of 20,000 in one day. This was considerably in excess of last year by several thousands. The result was due mainly to the efforts put forth by Mr. Ensor, who offered prizes of the value of 30 guineas for the best drafts of horn ewes entered for sale at the fair; and this evoked a spirited competition. The prize ewes of Mr. Mayo's fetched the top price—80s.; other good lots made 68s. to 74s.

SOUTHDOWNS.

This is the principal breed of the Downs variety, and is favored by the Prince of Wales and Lord Walsingham, who have flocks of unrivalled excellence. The Southdowns are beautiful sheep, and, though short in wool, make capital mutton. Very few sales took place last season. The rams belonging to the executors of the late Mr. Thomas Jackson, Deepdale, near Scarborough, were sold. The 36 rams offered were in high condition, and realized £6 10 s. average. Two grand sheep were purchased by Lord Londesborough for £9 and £7 each; four others sold for over £9 per head, and another for £8 5s. Mr. W. Rigden, of Hove, sold 26 shearling rams at an average of £21 16s. 6d. each. This was a capital price for sheep, and Mr. Rigden was well rewarded for his labor in breeding such an excellent flock. In addition to the numerous honors Mr. Rigden's flock has gained at the Royal Show since 1850, it has also taken 24 prizes at the Bath and West of England, 4 prizes at the Southern counties, and various prizes at other shows. The secret of the success of the Hove flock doubtless lies in the fact that the present shepherd has been with Mr. Rigden for twenty-one years, and during that time 28 first, 26 second, and 6 third prizes have been won.

ROMNEY MARSH.

This breed, which is confined chiefly to this district, has been wonderfully fortunate of late years, and Mr. George Slater, of Canterbury, does all he can to keep it in front. In the south Kentish sheep are extremely popular. At a sale of 57 rams belonging to Mr. Powell prices ranged from £7 7s. to £43, and 4 fetched between £29 and £35. These are good figures to pay for the much-despised Kentish breed.

OXFORDSHIRE DOWNS.

These have taken quite a firm hold of the affections of many breeders in Bedfordshire, Bucks, Hunts, &c. The Oxford Down is an attractive sheep, and the specimens exhibited at the Royal York Show were worthy of the national gathering. Quality was observable all along the line, and where so much excellence was discernible they were most difficult classes to judge. The ram sales were fully successful, and attracted numerous buyers from the continent. At Mr. John Treadwell's sale at Upper Winchendon, a number of shearling and ram lambs were disposed of at an average of a trifle over £23 12s. A number of the rams were bought for Germany, although a few were picked up by our Gallic neighbors. The Fyfield flock of Mr. A. F. Nulton-Druce averaged £17 10s., and the Biddenham lot realized the handsome average of £15 11s. Mr. Albert Brassey, who was so successful at the Royal Show at York, was equally fortunate in the sale ring. The Heythorp flock averaged £14, being an increase of nearly £1 compared with last year's average. Mr. George Street, of Maulden, obtained an average of £10 1s. 3d. Mr. Fred. Street, of Somersham Park, also disposed of 40 fine sheep at an average of £14 9s. 8d. Mr. John Worley's flock averaged £14 3s. 2d., and Mr. Ed. Gillett's Bampton flock obtained an average of £15 3s. Drafts were sold from various flocks, the averages ranging from 4 to 10 guineas. Equally favorable prices were obtained for ewes and ewe lambs; and on the whole the Oxford Downs went off very well. They are great favorites on the continent, and before long will be found in the United States.

HAMPSHIRE DOWNS.

These are a comparatively new variety,* and are said to have been produced by Southdown crosses on the old Wiltshire sheep. The breed possesses in a high degree the qualities of fecundity and early maturity. Indeed, we have known 100 wether lambs, just a little over six months old, fetch 72s. per head; and as for weight, three lambs under ten months weighed at the last Smithfield Club Show (1882) 224 pounds each, live weight, or upwards of 35 pounds per quarter butchers' meat. These sheep are massive, broad, even, deep, and close-wooled, and do well on dry chalk soils. The Hampshires fared particularly well both in the show-yard and in the sale ring. Mr. Alfred Morrison, after his Hamburg success, won well at York with large, long, and lusty animals. Mr. William Parsons (Micheldever) also had a fair time of it, and secured first and second in the shearling ewe class with well-rounded, neat sheep. In the sale ring his flock averaged £15 13s. for rams, and 97s. 3d. for ewes. The Hackwood flock of Mr. John Barton averaged £12 10s. The Wrotham Hill Park lot were quickly disposed of at an average of £6; two of the rams being bought for exportation to Jamaica. The supply at Welton fair exceeded 100,000, and were chiefly bought by flockmasters in the western counties. Mr. Twiddell's flock fetched from £4 14s. 6d. to £12 12s.; and Mr. John Parris's averaged about 7½ guineas, and Mr. H. Dudding sold 16 rams at an average of £12; and Professor Wrightson disposed of 40 at from £6 to £7 10s. each. Mr. Oakley had 150 from his Underwood Hall flock, which fetched from £7 to £10 each. Six rams were bought at Peterborough at £5 10s. each for shipment for Buenos Ayres. Mr. F. Boyce (Manor Farm) disposed of 1,400 ewes and lambs at high prices, the total sum realised being £4,484 17s. The Broadfield lot, belonging to Mr. William Lane, averaged £17 7s. 8d., the average last year being £17 15s., and in 1881 £12 8s. 9d. The Homington flock was weeded to the extent of 131 lots. The rams were let as high as 67 guineas. Mr. Dibben hired at 42 guineas; Mr. Parsons, of Micheldever, at 61 guineas. Ram lambs were sold at 41 guineas, which was given by Professor Wrightson. At the sale of Mr. Palmer (Berry Court, Wallop, Hampshire) ram lambs were let at from 7½ to 22 guineas each, the average of 70 being £11 19s. 6d. A number of rams of the well-known Fonthill flock, which took the champion prize at the Hamburg Show, were let and sold at high prices. The ram lambs were let for the season at 64 guineas. The average at which 13 lots were hired was £34 6s. 6d. The selections from the flock of Mr. W. Cheyney Street made satisfactory prices, and the draft ewes, which were remarkably well matched, sold for upwards of 5 guineas each.

SHROPSHIRES.

This breed is making great headway, and seems to be a great favorite everywhere. They are fancied not only in Shropshire, but are found in Scotland, Wales, Ireland, and in several continental countries, while numbers have been exported to Canada. That the breed is decidedly popular cannot be denied.

*Next oldest to Southdown.

The top figures in the sale ring are paid for Shropshires, and they still maintain their high character for good mutton. High prices were paid for good rams. Lord Chesham obtained £178 for one; Mr. R. Thomas sold two at £110 and £126; Mr. J. Evans got 115 guineas for one; Mr. J. Beach 110 guineas; and Mr. T. J. Mansell 105 guineas. The Birmingham sales were most successful. Mr. C. Randell gave 100 guineas for one of his lordship's shearlings. The ewes at Birmingham also made high figures. The lot sent by Mr. Henry Lovatt, of Bushbury, Wolverhampton, were run up to 200*s.* each; and some of Mr. A. S. Berry's flock sold for 210*s.* each. The lot sent by Mr. J. Pulley, M. P., were sold at high prices for Canada. The highest average for 60 ewes was obtained by Lord Chesham at 150*s.*, an average which has never been exceeded at Birmingham. The Hattons flock, belonging to Mr. J. Beach, sold and let well, and the average for rams was £27 12*s*, and for ewes £7 14*s.* 10*d.* Mr. T. J. Mansell, of Dudmaston, secured 105 guineas for his first-prize shearling at York, and the average was £24 12*s.* 4*d.* The famed Uffington flock of Mr. John Evans averaged £30 6*s.* 2*d.* for 37 shearling rams, and a little over £10 for ewes. At the annual sale of Messrs. Crane and Tanner, of Shrawardine, Lord Chancellor was sold at 65 guineas. and Royal Consort let at 75 guineas. The average was £19 14*s.* 10*d.* One lot of five shearling ewes was bought by Mr. Darling at 16 guineas per head. Mr. Charles Byrd never penned a better lot than those he offered at Littywood. The 34 averaged a little under 8½ guineas a head. The selection of rams and ewes from the Montford flock, the property of Mr. T. S. Minton, averaged for the rams let and sold £22 3*s.* 6*d.* The ewes, for which this flock is so famous, averaged £9 14*s.* each. Mr. Thomas Mansell's Harrington rams sold well. One was let to Mr. Farmer at 85 guineas. A two-shear ram, Baron Plassy, was sold to Mr. J. L. Naper at 86 guineas. The average of the rams was £24 18*s.* 9*d.*, and the ewes averaged £6 11*s.* 9*d.* Mr. Robert Fisher's rams (Leconfield, Beverley) averaged a little over £11 2*s.* The average obtained for the Onibury flock of Mr. F. Bach was £10 12*s.* 10*d.* The flock belonging to the late Mr. George W. Langdale, of Leconfield Park House, near Beverley, was disposed of, the rams making an average of £7 5*s.*, the ewes fetching prices up to 87*s.* each. The Beaumontcote rams, the property of Mr. William Hesseltine, made an average of nearly 12 guineas. The highest price was 31 guineas. At Beaudesert 35 rams, the property of Mr. John Darling, realized an average of £9 14*s.* 6*d.*; the ewes (a splendid show) £5 15*s.* For the ewes the highest prices realized were 155*s.* and 160*s.* each. Mrs. Barrs's rams at Odstone Hall made fair prices, and the ewes sold at 160*s.* each. Mr. Richard Thomas, of Baschurch, got an average for rams sold and let of £28 7*s.* each, and ewes rather over 9½ guineas each. For shearling ewes, in pens of five, the Hon. G. Smith gave £126, and a Canadian gentleman paid £110 5*s.* for another lot. Mr. J. L. Naper, of Loughcrew, had a good sale. Mrs. Barrs, Odstone Hall, Atherstone, got the gem of the shearlings at 120 guineas, the highest price ever paid for a ram in Ireland. The 36 rams averaged £18 6*s.* At Mr. Thomas Fenn's Home Farm, Downton Castle, the highest priced shearling ram was bought by Mr. J. C. Phillips at 35 guineas. The old-established Haughton flock was dispersed on account of the decease of the proprietor, Mr. Charles Wadlow. The ram Bridgnorth was knocked down at 30 guineas. The 23 rams sold averaged £11 9*s.* 7*d.* each. Mr. J. E. Farmer sold a lot of rams and ewes. The shearling rams ranged from 7 to 23 guineas, the latter being the highest price, and paid by Earl Powis. The ewes fetched fair prices. During the season Colonel Ridgway was a good buyer, and turned up at several sales, and what is more, selected good stuff and gave stiff prices. Good stock were sold, and their value was realized. Indeed, all round the Shropshire sales of 1883 will compare favorably with those of previous seasons.

CHEVIOTS.

The lithe and handsome Cheviots were in great force at the Lothian and Border sales. The Cheviots showed a great increase in number on last year. At the autumn sale at Hawick upwards of 1,300 rams were catalogued, being nearly 500 more than last year. The bulk were Cheviots. Mr. Robson, Bellingham, sold a Cheviot ram for £55, and another was sold for £45. The average was £13 19*s.* In a few instances the average prices of last year were overtopped. The highest price obtained for the Hindhope rams was £51; at Edinburgh there was some crack lots, and the animals were shown to the best advantage. In several cases they realized the highest average, £9 6*s.* 4*d.*, and they likewise topped their class, Mr. Paterson, Crookedston, giving £25 for a handsome shearling.

THE BLACK-FACED SUFFOLK.*

These are rapidly coming into favor in East Anglia. This breed differs to some extent from the Scotch Blackfaces. The Suffolks are proper niggers, so far as face and legs

* First described in August, 1883, by H. Rains Jackson, in "The Field," but here unacknowledged.

go, and the more sable they are the better. This breed is a cross between the Southdowns and Norfolk Blacks of half a century ago, probably improved with Hampshire Down crosses. The meat of the Suffolk is juicy and lean, and the mutton is much in request in various centers. The breed is active and hardy, and can live where other varieties would be famished. Mr. E. Gittus made the top figure of the season, namely, £20, and the average being £14 2s. Mr. Gittus's shearling ewes fetched 126s. for the best pen at Newmarket, where Messrs. Slater and Northend both sold rams at 26 guineas each, and the Marquis of Bristol got 25 guineas for another. At Ipswich fair Mr. J. A. Smith's consignment was one of great promise, having been selected from the best ewes of his flock. He sold 16 ram lambs at an average of 13 guineas, and 40 lambs at an average of £9 3s. Messrs. Sexton and Grimwade, who were the first to inaugurate the auction competitions, sold 70 ram lambs and a fine lot of ewe and wether lambs. A fine ram was purchased by Mr. Robert Cross for £5 5s. Mr. W. Gurdon, of Brantham Court, sold his best specimen for £13 10s. Mr. E. Fyson sold 12 ram lambs at 12½ guineas, &c. Mr. Jacob Walker sold his flock, as he was about to take a smaller farm. The Suffolk ewes made high prices. The 210 shearlings realized a total of £911. The highest figure realized, 95s. per head. Shearling rams realized from £8 to £3.

SCOTCH BLACKFACES.

In Scotland Black-faced sheep are supplanting the Cheviots, as it is a more hardy breed, which has weathered the storms of severe winters more successfully, and on this account larger numbers have been offered for sale all over the country. They met an exceedingly good market, and averaged within a shade of £16 each. Mr. Brydon, of Burncastle, had the next average of £10 13s. The highest price paid of £45 was by Mr. Thorburn, Stonehill. Mr. Dodd, Northumberland, also bought one at £44. The Duke of Argyll bought one at £37, and another at £24.

Mr. Charles Howatson, of Glenbuck, Ayrshire, offered a wonderful lot at his twelfth annual sale, and made capital prices. A three-shear ram made £20. The highest prices were given for three shearling rams, sired by Glenbuck Yet. Mr. Fleming, Lesmahagow, paid the top figure of £43 for Glenbuck Again. Mr. M'Naughton, Aberfeldy, bought Arabi at £30; and Mr. Hamilton, Tyndrum, gave £29 for Duncan Gray. The tup lambs got by Glenbuck Yet made the remarkable average of £13 14s. 6d. each, Mr. Brydon, Burncastle, paying the extraordinary sum of £28 10s. for a handsome ram, combining symmetry, size, and substance. This price has never been equaled for a Blackfaced lamb, the highest last year being £13.

Mr. Malcolm, of Poltalloch, Argyllshire, sold some Black-faced sheep. The shearling tups averaged £7 a head. Mr. Campbell, Ormaig, bought the highest priced one at £36. The total increase on the stock proceeds of last year's sale for a similar number of sheep was £600. This shows that the Blackfaces are gradually rising in value in Scotland.

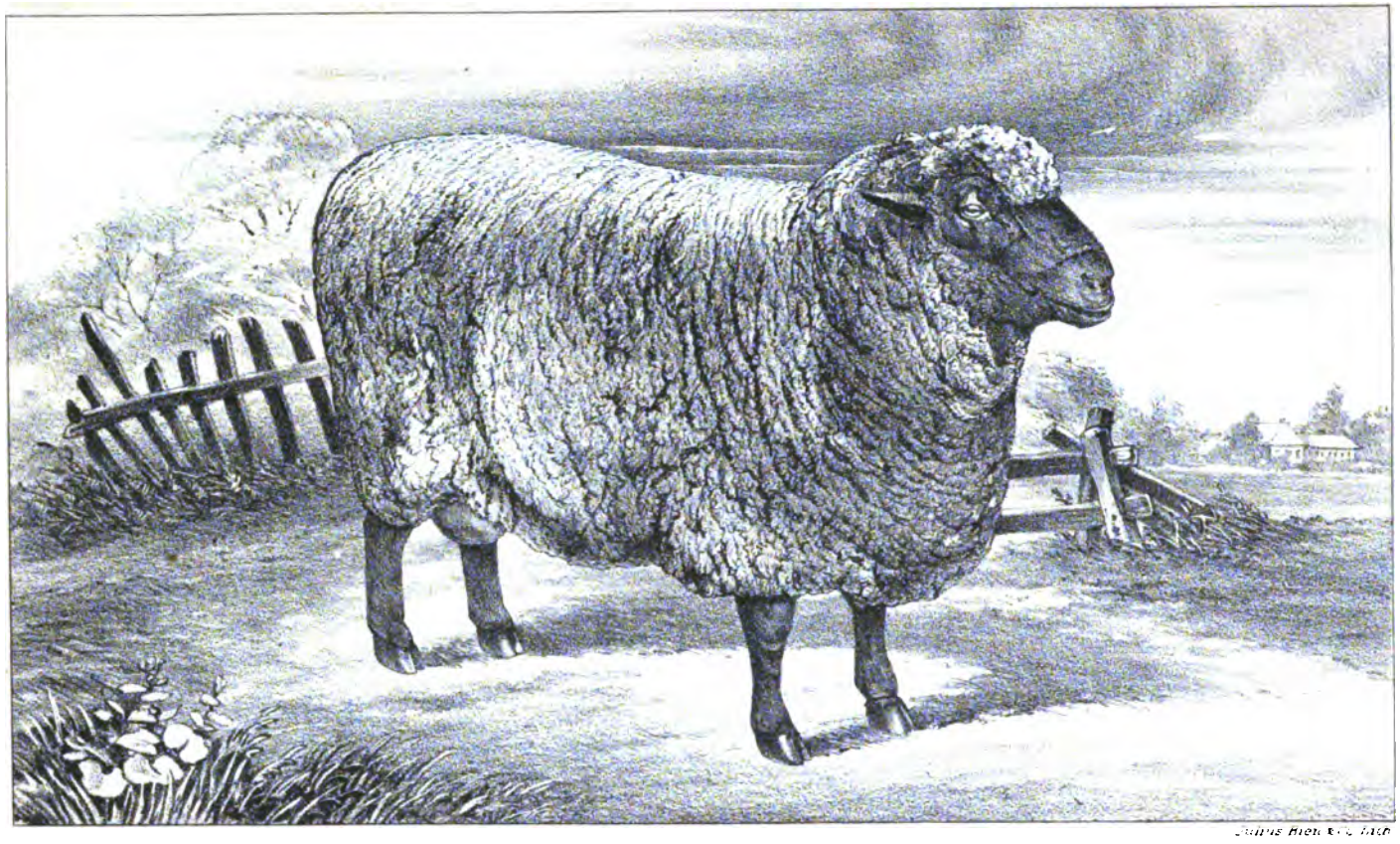
There were doubtless many other sales and incidents worthy of remark which transpired during 1883; but we have simply dealt with the facts as presented to us in the markets. Under the circumstances, flockmasters are to be congratulated on the results of the past season's sales, and to hope for a continuance of the same friendly competition in the year 1884.

SHEEP PORTRAITS.

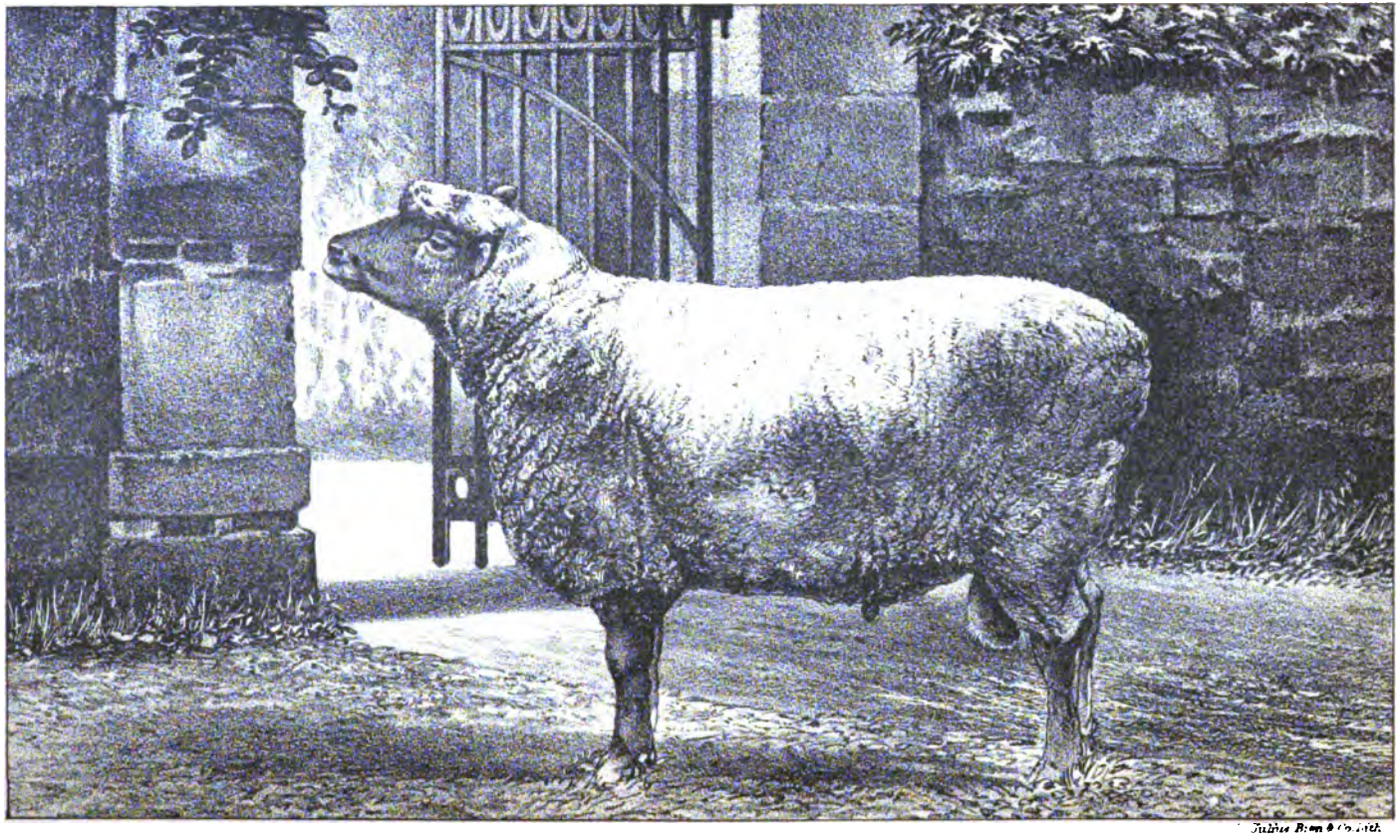
[Inclosure No. 8 in Consul-General Merritt's report.]

The portrait (Plate 367) is reproduced from the Agricultural Gazette for 1874, as a fitting illustration of the Oxford Down breed. This ram was shown by Mr. C. Howard at the Hull and Cardiff meetings of the Royal Agricultural Society, and he was commended at both places. Everyone knows that the history of the breed includes many names, such as Treadwell, Gillett, Druce, Howard, Street, and others; and illustrations might have been selected—reproduced from former years—of sheep from any of their celebrated flocks. We have selected the illustration here given, however, as being on rather a larger scale than the others; and, notwithstanding a certain distortion due to the lens, including much exaggeration of the head and muzzle of the sheep, as being a fair representation of the excellent and massive form, fine character of wool, &c., indicative of the breed.

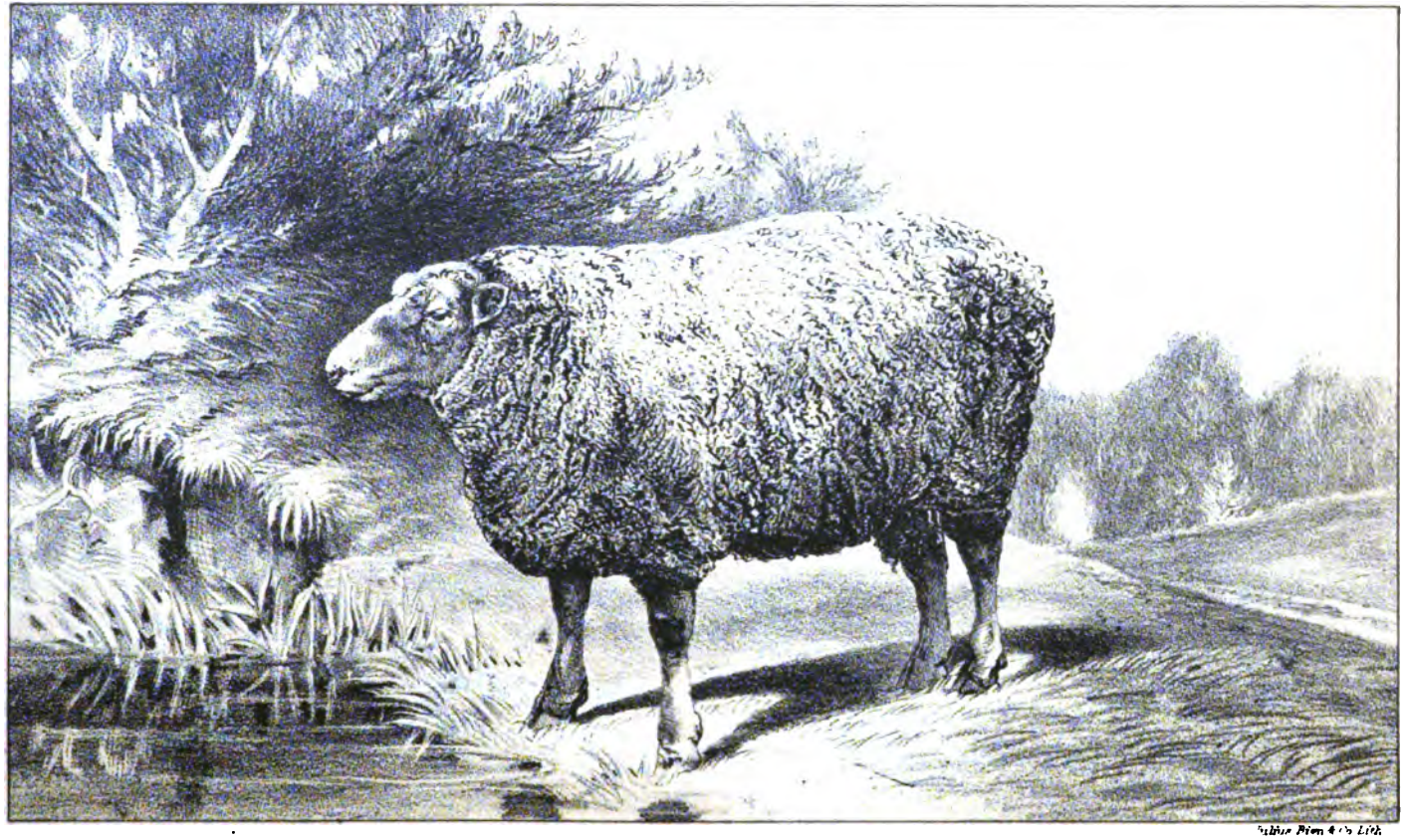
This breed originated in a cross between the Cotswold ram and the Hampshire Down ewe; and Mr. Twynam, now of Winchester, was one of the leaders, forty years ago, in maintaining that the breed should be made permanent by continuing to breed from these cross-bred sheep, until at length a permanent type was established. This has now been



OXFORD DOWN SHEEP



MR A F MILTON BRUCE'S OXFORD DOWN RAM "CAMPSFIELD"



THREE YEAR OLD LINCOLN RAM "HERMIT"

accomplished. The breed is remarkable for mass and quality of mutton, combined with a heavy fleece. Prices are large, and those for ewes in any other breed are now given for well-bred Oxfordshire Down rams.

MUTTON AND WOOL.

The portraits will, we believe, be admitted to be successful representations of two capital breeds of sheep. The form, thanks to the photographer, and even the character of the wool, thanks to the artist, are very successfully depicted. There is a certain amount of distortion seen in the exaggerated length of the hind leg, as compared with fore leg in the Oxford Down; and that the two pictures are not drawn to a common scale may be gathered from a comparison of the shepherds, as well as of the sheep; but we claim to have succeeded, nevertheless, in representing to our readers good and characteristic portraits of two very important breeds.

Plate 368 represents "Hermit," a Lincoln ram, 3 years and 4 months old, shown at Liverpool by Mr. Henry Smith, of the Grove, Cropwell Butler, Bingham, Nottinghamshire. He took the first prize for Lincoln rams, other than shearlings. He was bred by Mr. T. Casswell, Pointon, Falkingham.

Plate 369 is a portrait of an Oxfordshire Down ram, "Campsfield," belonging to Mr. A. F. Milton Druce, and shown at Liverpool in the class of older rams, where it took the first prize. It is 3 years and 5 months old, and was bred by the exhibitor.

BERKSHIRE PIGS.

[Inclosure No. 9 in Consul-General Merritt's report.]

SUTTON, WIMBORNE, DORSET,
January 8, 1884.

SIR: My specialty is pigs; therefore I imagine any remarks on such would hardly come under the above-printed queries. I have for years been very successful as a breeder of large white pigs, and more recently of Berkshires, having secured at the Smithfield Club show, in December, 1883, the champion award for the best pen of pigs in the show. These Berkshires at eight months one week and three days old weighed each 16 score pounds. My white pigs are hardy, and famed for size and early maturity; *e. g.*, the pen exhibited at the same time as the Berkshires, also taking first prize, attained the average weight each of 32 score pounds at sixteen months. My opinion is that the Berkshire breed is the most hardy, and could be bred and reared in the United States with the most perfect success. I feed my pigs on barley and maize-meal.

I am, sir, your obedient servant,

JOSEPH SAUNDERS.

[Inclosure No. 10 in Consul-General Merritt's report.]

My Berkshires answer admirably. My sows run out on grass land nearly all the year round, except when they have young. I have 260 acres of plowing, and I find swine dispose of my tail corn more profitably than sending it to market.

I sell all my pigs for breeding purposes, having a good name for them.

ALFRED ASHWORTH.

TABLEY GRANGE,
Kemsford, Cheshire.

THE YORKSHIRES.

[Inclosure No. 11 in Consul-General Merritt's report.]

Pigs have been my great weakness. I have during the last twenty-five years tried all our English varieties. Berkshires, I found, were poor breeders and sucklers, and grew very slowly when from three to six months old. Tamsworths were shy brutes and very slow payers or feeders. The small blacks and small whites are good breeders and fatten quickly at any age, but their meat is too fat for present tastes. The common English pig is a brute prolific enough but ruinous to fatten. I have found the middle white

and the large, white Yorkshire far away the best of all. They are very prolific, grow fast, and fatten quickly at any age, and the carcase is exactly what is now required either for pork or bacon purposes. I have now a herd of 340, all eligible for entry in the proposed herd-book which a few of us are trying to establish. I try to keep my pigs as naturally as possible, feed well, give plenty of exercise, and begin to breed from them early. I send them all over the world.

SANDERS SPENCER.

THE BLACK SUFFOLK PIG.

[Inclosure No. 12 in Consul-General Merritt's Report.]

District:
Mean temperature, 50° F.; temperature in summer, 60° F.; winter, 40° F.;
Soil, sandy preferable.
Subsoil geological strata, grit.
Pasturage, natural or artificial grasses:
How is stock housed? Warm and dry, avoid floors or walls which are good conductors of heat and cold.
Name of breed:
Suffolk small black-breed pig.
Size at maturity? 420 pounds.
Origin of breed:
Crosses between Essex, Chinese, Dorset, and other breeds.
Description, and how long pure bred? Thirty years or more.
Color? Black.
Maturity? Eighteen months.
Meat? Short, sweet, and juicy.

Black pigs are preferred to white ones because they stand exposure to the sun's rays better when out feeding on the pastures or clover leys in summer. During a greater portion of the year this description of pig will find its own living on good, well-drained pastures, with an occasional rain upon the stubbles or clover leys. They are small feeders and very contented and easy-tempered. When fattening it is sometimes difficult to get them to take sufficient exercise. They can be forced into early maturity, at six months of age, if required.

J. A. SMITH.

AKENHAM, *Ipswich.*

INDEX.

SECRETARY'S LETTER TRANSMITTING TO THE SPEAKER OF THE HOUSE OF REPRESENTATIVES REPORTS, IN REPLY TO A DEPARTMENT CIRCULAR, FROM THE CONSULS OF THE UNITED STATES, ON CATTLE AND DAIRY FARMING AND THE MARKETS FOR CATTLE, BEEF, AND DAIRY PRODUCTS IN THEIR SEVERAL DISTRICTS.

Principal points of circular to consuls, 3; exports of cattle and cattle products from the United States to the United Kingdom and to all other countries during the year 1884, 4; number and value of live cattle imported into the United Kingdom, value per head, and the countries whence imported, during the year 1884, 5; American cattle the best general cattle, 6; number of oxen imported into the United Kingdom during the years 1875 and 1884, and the countries whence imported, 7; quantities and value of fresh beef imported into the United Kingdom during the year 1884, and the countries whence imported, 7; value per pound of the fresh beef imported from the several countries into the United Kingdom during the years 1880–1884, 8; American fresh beef in the English market, 8, 9; number of live cattle in the several countries of Europe, 10; purposes for which cattle are raised in the several countries of Europe, and the wants and supply of the several countries, 11; imports of meat, preserved otherwise than by salting, into the United Kingdom during the year 1884, total quantities and value, value per pound, and the countries whence imported, 12; number of cattle in countries outside of Europe, 12; fresh-meat trade of Germany with the Argentine Republic, 13; dairy products in Europe, 14; butter imports of the United Kingdom, total quantities and value, value per pound, and the countries whence imported, 1884, 15; exports of American butter, decreased consumption of, in England and causes thereof, 16, 17; Irish hermetically sealed butter, 18; exports of oleomargarine from the United States during the year 1884, 19; cheese imports of the United Kingdom in 1884, total quantities and value, value per pound, and countries whence imported, 20; exports of American canned and salted beef, beef-tallow, &c., during the year 1884, 21; total exports of American cattle and cattle products during the year 1884, 22; cattle-breeding in foreign countries, 22, 23.

TABULATED STATEMENTS ACCOMPANYING THE SECRETARY'S LETTER.

Cattle statistics: Page.

(1) Statement showing the exports of cattle from the United States during the eleven years ending with the year 1884, showing the numbers and total value and the value per head of the cattle exported to each country 25

(2) Statement showing the imports of cattle into the United Kingdom during the eleven years ending with the year 1884, showing the number and total value and the value per head of the cattle imported from each country 25, 26

Fresh-beef statistics:

(3) Statement showing the exports of fresh beef from the United States from the year 1877 (the first officially recorded year of its export) to and including the year 1884, showing the quantity and total value and the value per pound of the exports to each country .. 28

(4) Statement showing the imports of fresh beef into the United Kingdom during the eleven years ending with the year 1884, showing the quantity and total value and the value per pound of the imports from each country 29

Butter statistics:

(5) Statement showing the exports of butter from the United States during the eleven years ending with the year 1884, showing the quantity and value of the exports to each continent and country therein 30, 31

(6) Statement showing the imports of butter and oleomargarine into the United Kingdom during the eleven years ending with the year 1884, showing the quantity and total value and value per pound of the imports from each country 32, 33

Cheese statistics:

(7) Statement showing the exports of cheese from the United States during the eleven years ending with the year 1884, showing the quantity and value of the exports to each continent and country therein 34, 35

Cheese statistics—Continued. Page.
(8) Statement showing the imports of cheese into the United Kingdom during the eleven years ending with the year 1884, showing the quantity and total value and the value per pound of the imports from each country 96
General statistics:
(9) Statement showing the exports from the United States of cattle and cattle products—horned cattle, fresh beef, canned beef, other beef, butter, cheese, beef tallow, and oleomargarine—during the year 1884, showing the number and value of cattle and the quantity, and value of the several products exported to each country 37–44

INDEX OF SUBJECTS.

Abattoir: (*See, also* Slaughter-houses.)
Elberfeld, statistics of 401
Lisle, mode of dividing an ox at 261
Paris, mode of dividing an ox at 260
Statistics of 258
Abbey farm herd of Shorthorns 72
Aberdeen, topography, soil, climate, &c 166, 195
Acknowledgments:
[In addition to the many names of individuals and institutions which will be found in their alphabetical order in this index as contributors, the following are referred to in the several and respective reports in complimentary terms for courtesies shown and assistance rendered to various consuls-general and consuls, in the preparation of their papers.]
Belgium:
Bonar, Professor, Brussels 383
Chevron, Professor, Royal Agricultural Institute, Ganbloux 383
Leyder, Professor, Royal Agricultural Institute, Ganbloux 383
Minne, Edward, inspector of abattoir, Ghent 383
Seizsete, director of abattoir, Brussels 383
Tydgadt, Louis, secretary Agricultural Society of Flandre Orientale, Ghent 383
France:
Courregelongue, Marcel, secretary of the Society of Agriculture of the Gironde 272
Manager of the General Milk Company of Bordeaux 272
Germany:
Fuschman, Paul, Breslau 431
Galle, Professor, Breslau University 431
Gross, John, consular agent, for securing statistics for report of Consul Wilson on cattle in Oldenburg, Jeviland, and East Frisia 413
Körte, A., author, Breslau 431
Loefland, Oberamtman, president of Agricultural District Association at Kirchheim .. 450, 463
Neefe, Professor, Breslau Statistical Bureau 431
President of the Brunswick Central Agricultural Association 482
Rueff, Dr. von, late director of the veterinary school at Stuttgart 463
Sachs, Leo, Breslau 431
Saxon Government 426
States minister of the Grand Duchy of Baden 471
Statistical Bureau of Saxony 426
Vosaler, Professor, Royal Agricultural School at Hohenheim 463
Zeib, assessor, Royal Central Stalle for Agriculture, Wurtemburg 463
Great Britain:
Beck, Samuel, agent to the Prince of Wales, Sandringham 68
Clarke, E. G., Bristol 179
De la Perelle, George, Liverpool 137
Duckham, Thomas, M. P., Urwick 72, 179
Hine, N. J., Smithfield Club 179
Howard, J., and F. Bedford 70
Jones, J. Bowen, Shropshire 179
Kains-Jackson, Mr 77
Lawes, Sir John B., Rothamsted, Herts 79
Lord Moreton, M. P 17

Acknowledgments—Continued. Page.
Holland:
Ammersfoord, J. P., Badhoeve ... 502
Coning, Jongkindt, director of the agricultural school, Wageningen ... 515
Hengevald, Mr., Wageningen ... 503
Waldeck, P. F. L., secretary of the Holland Society, Loosdianen, near The Hague ... 383
Mexico:
La Pierre, Henrique, Matamoros ... 585
San Roman, Don Feliciana, Brownsville, Tex ... 585
Ontario:
Fuller, Valancey F., Hamilton ... 558
Geary Bros., London ... 540
South Africa:
Stockdale, Richard H., Wynnberg, Cape Colony ... 609
Adams, Lyell T., consul at Geneva:
(1) Report on cattle in the district of Geneva ... 321–323
(Cattle census; meat-cattle imports; results of breeding from imported cattle, 321; characteristics of Swiss cattle; special statistics of Swiss cattle, 322; housing, feeding, breeding, soil, grasses, &c., 323.)
(2) Report: The manufacture of Swiss cheese (for particulars *see* Cheese) ... 682–685
Adulteration of food products in Europe and the United States ... 16
Advice to Americans in regard to buying foreign cattle. (*See* Purchasing cattle, *and also under* United States.)
Africander cattle, characteristics ... 609
Milk, price, weight ... 670
Age for breeding cattle ... 82
Agriculture:
Average yield of Carlton County, Ontario ... 508
Central Chamber of, England ... 722
College, Ontario. Report of: On Shorthorns and Ayrshires, 549; on Herefords and Devons, 550; yield of different breeds of cattle at, 561.
Shows in England in 1883, list of ... 54
School of, at Aichstettin, Germany ... 456
Hohenheim, Germany ... 448–450
Alb cattle:
Characteristics, weight, &c ... 392
Price ... 396
Algau Dairy Association ... 457
Algauer cattle:
Butter yield ... 394, 439
Characteristics ... 439
Habitat ... 398, 406, 446
Markets for ... 394
Milk yield ... 394, 405, 406, 439, 448, 478
Origin ... 394, 405
Price ... 396
Weight ... 394, 405, 406, 439, 448, 478
Algerian cattle:
Care and handling ... 258
Characteristics ... 257
Milk yield ... 258
Allan, David. Experience of Ayrshire breeders ... 138
Allen, Charles M., consul at Bermuda:
Report: Cattle in Bermuda ... 639
Alps:
Dairying on ... 311
Grazing cattle on ... 310
American:
Beef, canned, in Hungary ... 533
Fresh, exports of, 1877–1884 ... 26, 37
in England, and British butchers ... 8
Salted, canned, and preserved, exports of, 1884 ... 21, 37
Butter, decline in exports, and remedy therefor ... 18
Decreased consumption of, in British markets ... 16
Exports of, 1874–1884 ... 30
vs. Danish and French in Ceylon ... 677

American—Continued. Page.
Cattle best general cattle in the world ... 4
Exports of, 1874–1884 ... 25
Fattening in England ... 49
Imports into Germany ... 403
Mexico ... 581
In Belgium ... 304
Bordeaux ... 279
Lower California ... 596
Oldenburg ... 423
Peru ... 686
Market for, in Ontario ... 552
Superiority of, in the British market ... 6
Cheese, butter, and oleomargarine in Holland ... 510
In the English market ... 20
Exports of ... 39
Craze for English cattle ... 52
Farmers at fault in cattle breeding ... 51
Horses in Belgium ... 382
Products, counterfeiting, in Belgium ... 369
for Belgian consumption ... 370
Analysis and value of cattle food in Germany ... 444, 445
Analysis of milk of Jersey cattle ... 123
Andalusia:
Cattle in ... 384
Grasses of ... 385
Pasturage and special statistics of cattle ... 385
Andalusian cattle, characteristics ... 386
Andrews, C. C., consul-general at Rio de Janeiro:
Report: Cattle in Brazil ... 630–632
(Brazilian cattle and the home market; the old native cattle, 630; mixed breeds in Brazil; consumption of beef and dairy products in Rio de Janeiro, 631; special statistics; weights, yield, characteristics, and origin of cattle; soil, housing, topography, &c., 632.)
Angeln cattle:
Census of bulls ... 492
Characteristics of ... 395, 490
Habitat ... 395
Milk yield of ... 410, 490, 492, 524
Origin of ... 492
Price of ... 396
Weight of ... 410, 411, 490, 492, 494, 495, 524
Anglesea, topography, soil, climate, &c ... 166
Appenzell cattle, characteristics of ... 307
Ardennaise cattle, characteristics of ... 361
Area, acreage, and cattle distribution in France ... 268
And population of Russia ... 521
Of Silesia ... 422
Venezuela ... 637
Argentine Republic:
Cattle *vs.* sheep in ... 612
Census of horned cattle in ... 13, 605
Driving cattle in ... 620
Estancias, cattle, in ... 609
Capital required to start an estancia in ... 619
Exports of cattle products from ... 606
Fresh-meat trade of, with Germany ... 13
Future of cattle-raising ... 620
Guacho herders, dexterity of ... 612
Herding cattle in ... 611
Improvement of breeds in ... 616
Introduction of horned cattle into ... 604
Management of cattle in ... 607
Marking cattle in, feasting, &c ... 612
Milch cows in ... 608
Milk and butter in ... 617
butter, and cheese in ... 608

	Page.
Argentine Republic—Continued.	
Prices of cattle in	618
Slaughter, cattle raised for	603
Slaughtering establishments in	612–616
Wild cattle of the pampas	604
Wintering cattle and losses therefrom	609
Working oxen and milch cows therein	608
Arnold, L. B., on "Exercise for Cows"	49
Ashworth, Alfred, on Berkshire pigs	789
Association:	
Dairies in Denmark (union)	498
England (co-operative)	719
Silesia	438
Wurtemberg	456
Dairy at Heidenfingen	456
Allgau	457
Heidenfingen	460
Laws of Wurtemberg	601–604
Aubrac cattle:	
Characteristics	253, 727
Cross-breeds	253
Meat yield	253, 727
Aure cattle:	
Characteristics, milking qualities, &c	736
Australasia:	
New Zealand:	
Breeds of cattle in:	
Alderney (Jerseys) characteristics, &c	643
Ayrshires, characteristics, &c	643
Devons, characteristics, &c	647
Herefords, characteristics, &c	645
Mixed, characteristics, &c	643
Polled Angus, characteristics, &c	647
Shorthorn, characteristics, &c	646
Census of sheep and cattle in	12, 642
Cost of transportation to the United States	649
Dairy farming in	649
Number of distinct cattle breeds in	649
Pasture lands of	642
Price of cattle in	649
Quarantine, cattle, regulations	643
Special statistics: cattle, soil, climate, &c	650
Tasmania, cattle census of	650
Victoria	651
Aveyron, dairying in	253
Aylmer, Hugh, on Abbey Farm, Shorthorns	72
Ayrshire, topography, soil, climate, &c	162, 209
Ayrshire cattle:	
Breeding	127
Butter yield	212, 643
Characteristics	68, 155, 162, 209, 211, 212, 220, 740
Dairy herds of	135
Feeding	136
Housing and treatment	136, 168
In Canada	539, 542, 547, 549, 552, 555, 556, 559, 564, 566, 567, 569
Finland	525
New Zealand, milk and butter yield	643
Maturity as meat producers	126
Milkers	127, 209, 549, 643
Milk to butter and cheese, proportion of	212
Milk yield	75, 127, 162, 171, 209, 203, 212, 216, 217, 219, 559, 643
Only Scotch breed of any object to Americans	217
Origin and history of	62, 124, 199, 212
Percentage of meat [at maturity	133
Price of	64, 169, 205, 214
Weight of	74, 128, 162, 171, 209, 216, 219, 525

Page.

Baar cattle:
Breeding ... 472
Census of ... 476
Characteristics ... 468, 472
Feeding ... 469
Habitat ... 469
Housing ... 469, 472
Milk yield ... 469, 472
Price of ... 470
Weight and size ... 469, 472
Baar district, topography, soil, climate ... 468
Grasses ... 469
Bacon, John E., chargé d'affaires at Montevideo:
Report: Cattle and cattle-breeding in Uruguay ... 622, 629
(Climate; value of lands and stock, 622; slaughter of cattle and exports of beef, 623; the Liebig extract of beef factory, 624; frozen-meat trade, 625.)
Baden, cattle breeds in ... 464
Census of cattle ... 471
Feeding and breeding ... 466
Neckar, cattle in ... 471
Products of cattle in ... 473
Baker, E. L., consul at Buenos Ayres:
Report: The cattle industry of the Argentine Republic ... 603–621
(Milk, butter, and cheese; cattle raised exclusively for slaughter, 603; introduction of horned cattle into the river Plate; wild cattle of the pampas, 604; census of cattle, 605; exports of cattle products, 606; management of cattle, 607; working cattle and milch cows, 608.
Estancias: From, to slaughter-house; requisites of, 609; number of animals an estancia will maintain; herding stock on, 611; cattle *vs.* sheep on; marking young animals on; horsemanship and dexterity of Guacho herders, 612; great slaughtering establishment, 613.
City slaughtering establishments, 615; efforts to improve Argentine cattle, 616; milch cows and butter-making, 617; prices of cattle, 618; future of the cattle industry of the Argentine Republic, 620.)
Baldwin, Prfoessor, on Kerry cattle ... 130
Ballow, Frank M., consul at Kehl:
Report: Cattle breeds of Baden ... 464–472
(Messkirch cattle; district of Messkirch, 464; peculiarities of cattle, 465; size and weight, breeding and feeding, 466; meat production and fattening, milk production, 467; prize winners, 468; Baar cattle, 468; stables, milk production, fattening, 469; census and prices of, 470; Black Forest cattle, 470; Odenwald and Neckar cattle; cattle census of Baden, 471; special statistics of Badish cattle, 472.)
Barmen cattle and cattle product, supply of ... 399
Climate of ... 400
Barter, Richard, on Kerry cattle ... 130
Basquaise cattle, characteristics, habitat, milking qualities ... 726
Bavaria, cattle of, characteristics of ... 475
Census of domestic animals of ... 753
live stock of ... 709
Cheese (Limburger) and butter of ... 480
Cultivated grasses in ... 477
Handling cattle products in ... 478
Housing, feeding, and breeding cattle in ... 477
Soil and substratum of ... 476
Special cattle statistics of ... 478, 479
Topography, soils, climate, &c., ... 475
Bazadaise cattle:
Calves, raising ... 275
Characteristics of ... 225, 274, 725
Cross-breeds ... 225, 274
Grazing grounds of ... 276
Origin ... 255
Superiority of meat ... 225, 274
Weight and value of oxen ... 275
Working ... 725

Page.
Beach, Horatio N., consul at Guayaquil:
Report: Cattle breeding and cattle products of Ecuador 634, 635
(The seasons in Ecuador, milk yield, number and value of cattle, 634; cultivated grasses; profits of cattle raising; origin and characteristics of cattle; topography, soil, pastures, &c., 635.)
Bearnaise cattle, characteristics and milking qualities 726
Beauchamp, Emory P., consul at Saint Gall:
Report on Swiss cattle and dairy products 303–320
(Government assistance to cattle breeders, 303; the spotted breed, 304; offshoots of the spotted breed, 305; the Brown Schwitzers; miscellaneous breeds, 306; cantonal prize shows, 307; old and new systems of stabling, 308; handling and caring of cattle, 309; cattle grazing on the Alps, 310; dairying on the high Alps, 311; purity of Saint Gall milk; milk-cure establishment; export of condensed milk; condensed-milk manufacture, 312; condensed milk factories in the United States, 313; butter-making in Switzerland, 314; imports of butter; centrifugal butter-making; cheese-making, 315; exports of Swiss cheese, 317; percentage of breeds in Switzerland; Swiss cattle in the United States, 318; milk-book of Charles Kuhn, Dejorsheim, 319, 320.)
Beck, Edward, on the Prince of Wales's herds of cattle at Sandringham 710
Beef:
American:
Canned in Hungary 583
Fresh, best means of sending to England 81
exports of, 1877–1884 ..... 28, 37
in Belgium 364
England 8
Salted, canned, preserved, &c., exports 21, 37
Consumption in Rio de Janeiro 631
Export from Chatham, Ontario 502
Export from Uruguay 623
Extract, Liebig's factory in Uruguay 624
Fresh:
British imports 7, 11, 28
Exports from Russia, Germany, and France 11
Imports into France 266
Increasing demand for, in Europe 13
Trade of the Plate 625
In Japan and China, no word for, in the languages 663
In Northern Mexico, price and quality 579
Bees in Saxony 431
Belgian cattle:
Suitable for the United States 364
Weight, size, &c 373
Belgian method for preserving meat and vegetables fresh 370, 639
Belgian milch cows 371, 374
Belgium:
Agricultural fête at Ghent 371
American products for consumption in 370
Breeds of cattle in, characteristics of 361, 367
(Ardennaise and Charleroi, 361; Fletchet and Flemish, 368; Furnese-Ambacht, 361; Hollandaise, 367; favorite breeds, 367; foreign and cross-breeds, 361.)
Cattle-breeding in 359
Census of cattle 367
Counterfeiting American products in 369
Dairy machinery in 371
Exportation of American horses to 382
Farming in 705
Imports of butter into 368
meat and cattle into 363, 369
Market for American beef and cattle in 364
Milch cows of 370–381
Milk yield of cows 363, 378–381
Milking qualities of cows 374
Preservation of meat and vegetables fresh in 370, 639
Prices of cattle 364, 365, 373

Belgium—Continued. Page.
Special cattle statistics of ... 365
Transportation of cattle to the United States ... 360, 382
Weight and size of cattle ... 365, 373
Belluno, province of:
Association dairies in ... 342
Cattle in ... 339
Dairying in ... 341
Topography, soil, climate, grasses, &c ... 356–358
Bergamasc cattle in Nice:
(Imports of; meat and milk products; prices) ... 286
Bermuda, cattle and cattle products in ... 639
Bickle, Richard, Bradstone, on Devon cattle ... 110
Bird, W. S., consul at La Guayra:
Report: Cattle interest of Venezuela ... 637, 638
(Inadequate communication with the interior; area and cattle plains; number of people engaged in cattle-raising; rounding up; public pasturage; price of cattle, &c.)
Birkenfeld cattle, characteristics, weight, milk yield, &c ... 489
Price of ... 487
Bogota, plains of. (*See* United States of Colombia.)
Bomboldt, Pet., consular agent at Riga:
Report: Cattle in the Baltic provinces ... 524
(Podolian cattle for the United States; price, &c.; special cattle statistics, topography, housing, feeding, breeding.)
Bordeaux:
Cattle and meat supply of ... 279–281
Census of district ... 281
Cost of introducing; stabling, feeding, &c ... 281
Export of American cattle to ... 279
Bordelaise cattle:
Characteristics ... 276
Feeding and housing ... 277
Grazing grounds ... 276
Milk yield ... 276
Not suitable for export ... 276
Origin, weight, price ... 276
Boshell, Martin, vice-consul at Bogota:
Report: Cattle on the plains of Bogota ... 633
(The *rumilla* pest; food, breed of cattle, topography, temperature, &c.)
Bowden, George F., on Welsh cattle ... 156
Branding cattle in Argentine Republic ... 612
Branding cattle in Mexico ... 578
Brasil:
Beef and dairy products, consumption in Rio de Janeiro ... 631
Brazilian cattle and the home market ... 630
Mixed breeds in ... 631
Native cattle ... 630
Special cattle statistics of ... 632
Topography, soil, climate, &c ... 632
Breeders. (*See* Cattle-breeders.)
Breeding. (*See* Cattle-breeding.)
Breeds of cattle in the various countries. (*See also* Special statistics.)
Africander ... 609, 671, 672
Alb ... 392
Alderney (*see* Jersey) ... 648
Allgauer ... 391, 394, 396, 398, 405, 406, 416, 438, 439, 446, 478
Algerian ... 257, 258
Andalusian ... 384, 386
Angeln ... 395, 410, 490, 493, 524
Ansbacher ... 478
Aubrac ... 283, 727
Aure Valley ... 726
Ayrshire ... 63, 134, 165, 199, 211, 224, 525, 549, 556, 564, 570, 648, 744
Baar ... 468, 470, 472
Barétone ... 257

Breeds of cattle in the various countries—Continued. Page.

Basquaise ... 726
Bazadaise ... 265, 274, 725
Bearnaise ... 726
Belady ... 652
Bellunese ... 340, 353
Bergamasc ... 286
Birkenfeld ... 487
Black African ... 673
Black Forest ... 470
Black Spotted Jutland ... 490
Bordelaise ... 276
Brazilian, native ... 630
Brittany ... 245, 327, 336, 728
Buffalo ... 326, 528, 530, 658, 660–662, 672, 668
Camargue ... 271
Canadian, native or French ... 530, 540, 556, 564
Charlevois ... 361
Charolaise ... 246, 724
Chianina ... 330, 334
Chelmogorian ... 519, 524
Comtoise ... 250
Criollo ... 633
Devon ... 57, 70, 108, 158, 191, 539, 550, 559, 647, 670, 739
Dexter ... 228
Donnersberg ... 485
Drenthish ... 504, 515
Dutch ... 367, 392, 398, 404, 411, 426, 480, 503, 504
Dutch-English ... 504, 515
Eifel ... 488
Ellinger ... 478
Femeline ... 250, 725
Flechet ... 368
Flemish ... 241–243, 368, 504, 515, 724
Flemish-Geldrian-Holland ... 504, 515
Freiburg ... 291, 304
Freiburg-Friulano ... 326
Friesland ... 503, 670
Friesland-Drenthish-Geldrian ... 504, 515
Frisian (East) ... 398, 408, 417, 420, 421, 426
Furnese Ambacht ... 361
Garonnaise ... 254, 272–274, 725
Galician ... 385
Galloway ... 62, 147–158, 194, 210, 219, 539, 557
Gascon ... 257, 725
Geldrian ... 504, 515
Glan ... 439, 478
Groninger ... 503, 515
Groninger-Friesland-Geldrian ... 504
Guernsey ... 64, 124, 741
Haars ... 490, 482
Haysy ... 652
Heilbroner ... 439
Hereford ... 58, 72, 110, 161, 173, 181, 190, 538, 645, 649, 664, 670, 739
Highland ... 63, 142, 196, 212
Hinterwalden ... 473, 474
Holsteins* ... 398, 426, 504, 552, 556
Holland (*see* Dutch) ...
Jersey ... 64, 116, 160, 205, 551, 557, 558, 564, 572, 648, 670, 741
Joulany ... 652
Kelheimer ... 478
Kerry ... 65, 129, 670
Landaise ... 256, 277
Landvichrasse ... 480

*See remarks at page 504 regarding the misnaming of Dutch cows in the United States.

Breeds of cattle in the various countries—Continued. Page.
Limburger 391, 447
Limerick Dairy 228
Limousine 248, 278, 726
Longhorn 60, 94, 190, 739
Lourdes 726
Mancelle 249
Mantuan 326
Maremmano 332
Messkirch 464, 468, 473, 474
Mesticos 631
Mezeno .....
Mexican 587
Miesbacher 393
Moorish 672
Montefoner 393, 405, 446
Mountain 307, 329, 728
Mürzthaler 396
Nâta, curious breed on the Upper Uruguay River 616
Neckar 391, 447, 471, 473, 474
Normandy 248, 252, 724
Odenwald 471
Oldenburg 415, 418, 419, 420, 436, 490, 524
Parmense 326
Parthenaise 247, 727
Pianura 329
Piedmontese 325, 329
Pinzgauer 393, 478
Podolische (Podolian) 338, 354, 395
Polish 525, 526
Polled Angus 62, 164, 193, 209, 540, 543, 551, 557, 647
Pugliese 326, 346, 353
Pyrenean 257, 726
Quibanos 631
Red Polled (Norfolk and Suffolk) 61, 70, 71, 86, 162, 196
Rigi 405
Russian, common 519, 523
Saint Girons 726
Salers 250, 727
Scheinfelder 478
Schwab Hall 392
Schwitzer (Brown, Spotted, &c.) 291, 298, 304, 306, 394, 405
Shetland 142
Shorthorn 59, 69, 70, 72, 76, 98, 157, 188, 213, 226, 419, 538, 547, 555, 564, 570, 577, 646, 670, 728, 735–738
Simmenthal (Bernese) 287–291, 304, 305, 391, 404, 442, 444, 478
Singhalese 656
Suffolk 739
Sussex 61, 114, 160, 197, 739
Swiss (not particularly defined) 326, 332, 344, 347, 349
Tarrentaise 728
Tondern 395, 410, 411
Triesdorf (misspelled *Friesdorf* on page 392) 392
Turino 631
Udine 337
Uri 726
Vogelsberg 485
Voightland 395, 442, 478
Welsh (Runts; Black cattle) 65, 153, 166, 198, 742
Westerwald 487
White Hungarian 528
Wild cattle 579, 604
Brewer, M. S., consul-general at Berlin:
Report: cattle in Prussia 408–413
(Cattle census of Germany, and cattle in Eastern Frisia, 408; cattle in Oldenburg, 409; cattle in Schleswig-Holstein, 410; cattle of Dutch descent, 411; statistics of various breeds; Prussian prize cattle, 412.)

Page.

British:
Cattle and cattle imports ... 79
best breeds for export ... 80, 204
markets ... 606
special excellence of each breed ... 203
where to purchase ... 170
Prize breeders, cattle ... 712
Brittany cattle:
Care of ... 246
Characteristics ... 245, 728
Habitat ... 245
Improved by crossing with Durham and Ayrshire ... 246
Milk yield ... 246, 728
Origin ... 245, 728
Brown, Prof. W., agricultural college at Guelph, Ontario:
Evidence regarding the valuable qualities of the native Canadian cattle ... 539
On Polled Angus cattle ... 541
Brunswick:
Breeds of cattle in (Harz, Holland, Landviehrasse, Oldenburg, 480; imported, 481) ... 480, 481
Census of cattle ... 481
Characteristics of cattle ... 482
Grasses ... 482
Prices and weight of cattle ... 482
Topography, soil, climate, &c ... 482
Brydon, Mr., steward of the Marquis of Londonderry, on Shetland cattle ... 142
Buckinghamshire, geological formation of, and cattle-breeding in ... 73
Bucks, England, cattle and sheep in ... 711
Buffalo cattle:
Ceylonese, characteristics ... 658
Hungarian:
Characteristics ... 530, 535
Milk yield ... 535
Price ... 531
Weight ... 535
Italian (Terra di Lavoro): Characteristics and uses ... 326
Javanese: Characteristics and uses ... 661
Malaysian and Siamese ... 660
Southern China: Humped buffalo ... 608
Yang-tse-Kiang Valley: Characteristics, work, weight, price, milk yield, &c ... 666
Buffington, H. C., commercial agent at Chatham:
Report: Cattle and cattle products in Southwestern Ontario ... 559, 564
(Cattle-breeding in the Chatham district, 559; relative yields of the different breeds, census of cattle in district, relative value of cattle-feed, 561; cost of cattle, beef exports of the Chatham district, 562; cattle exports to the United States, special statistics of cattle (breed, yield, weight, characteristics, origin, products), 563; topography, soil, grasses, housing, feeding, and handling products, 564.)
Bull keeping at Kircheim-under-Teck ... 450
racing in Landes ... 256
Bullock, George S., consul at Annaberg:
Report: Voightland cattle ... 442, 443
(Voightland, and cattle of; origin; characteristics.)
Bulls:
Abbey Farm herd: Sir Anthony, Stafford, Sir Simeon, Sir Benedict, Felix ... 73
Andalusian, fierceness of ... 384
Angeln, in Denmark, census and keeping ... 493
Ayrshire, Baron O'Bucklyre ... 224
Camargue, used for bull-fighting only ... 271
Census of, in Saxony, for breeding ... 427
Chianina, description of ... 333
Devon, Sweet William ... 740
Galloway, Black Prince, 152; Harden, 224.
Guernsey, Squire of Vanbelets ... 741
Hereford, Fisherman, 161, Romeo, 174, Sir Oliver, Malcolm, Leopold, Wellington, Victory, Cotmore, Brockwood, 187; Thoughtful, 740.
Highland: Portraits of two prize winners, 212; portrait of Duke of Athole's prize bull, 224.

Bulls—Continued. Page.
Jersey: Signs of pure breed ... 116
Longhorn, Darewell, 94; Prince Victor, 740.
Kerry: Portrait of a bull, 129; in Cape Colony, 670.
Polled Angus, Englishman, 139; Prince of the Realm, Young Hero, Allegro, and the Shaw, 210; Sir Maurice, 223; Solomon, 647.
Prices of, in Germany, various breeds ... 396
Red Polled, Davis 3d, 88; Portrait of bull, not named, 162.
Sandringham herd: Admiral, Baron Wolverton, Beauchamp, Denmark, Dereham, Downham, Dunkirk, Fortes, Fraternas, Gamester, Mariaa, Ponsapo, Pluto, Royston, Samson, Viscount ... 68
Selection of, in the marshes, Germany ... 415
Shorthorn, British Lion, 105; Foscoe, 213; Duke of Newcastle, 646; Duke of Underley, Anchor, 735; Telemachus, Duke of Howl John, 736; Duke of Leinster, Acropolis, Duke of Tegunter, 737; Sir Simeon, 738.
Sussex: Portrait of bull, not named ... 160
Burgi, Col. G., Arth, on Swiss cattle in the United States ... 318
Burkardt, Oeconomierath, president of the Agricultural Union, Rottweil, on Black Forest cattle ... 451
Burro, the (ass), in Mexico ... 591
Butchering cattle in Honduras ... 602
cutting up beeves in London, Lisle, and Paris ... 260, 261
Butchers and butcher shops, French *vs.* American ... 284
Butter:
American:
Decline in exports, and remedy therefor ... 18
Decreased consumption of, in England ... 16
Exports of, 1874–1884 ... 30
In Holland ... 510
vs. Danish in St. Thomas ... 641
vs. Danish and French in Ceylon ... 677
Belgian, Dutch, and French in the English markets ... 16, 496
Canadian, in the United States ... 573
Danish, exports, 1866–1883, quantities and value ... 495
in the English market ... 496–498
vs. American and French in Ceylon ... 677
French, Dutch, and Belgian, in England ... 16, 496
in Saint Thomas ... 641
Union dairy *vs.* old method ... 498–501
Dorsetshire, dairying in ... 176
Export, American ... 30
Danish ... 491, 495, 496
Swiss ... 315
Fresh *vs.* salted in France ... 283
Imports into Belgium ... 368
France ... 262
Saint Thomas ... 640
Switzerland ... 317
United Kingdom ... 13, 32
In Argentine Republic ... 603
Industry of Ireland ... 229, 235
Irish, hermetically sealed, long-keeping ... 229, 231
Isigny, celebrated French ... 244
Making in Hungary ... 531
Ireland ... 235
Italy ... 344, 681
Mexico ... 576, 588, 593
Switzerland ... 314, 315
Normandy ... 283
Prices in Cork, 1841–1881 ... 234
England, imported ... 16, 17
Mexico ... 586
Silesian ... 434
Thuringian ... 441
Trade of Cork ... 231
Unknown in Southern China ... 688

Butter—Continued. Page.
Yield. (*See also* Special statistics.)
Andalusian cows 386
Brazilian cows 632
British cows:
Ayrshire 75, 168, 171, 200, 212, 216, 219
Devon 75, 160, 192
Galloway 75, 195, 216
Guernsey 125–127
Hereford 161, 171
Highland 75, 197, 216
Irish cows 235
Jersey 118, 120–123, 167, 171, 201, 206
Kerry 131, 133, 184
Longhorn 75, 199
Polled Angus 75, 165, 171, 195, 216
Red Polled 90, 163, 171
Shorthorn 75, 103, 158, 190, 216, 227
Sussex 75, 198
Welsh 75, 166, 171, 198, 661
Danish cows 491
Dutch cows 437
French cows 244, 252, 265
German cows 392, 393, 394, 410, 412, 424, 435, 437, 439, 464, 472
Hungarian cows 535
Moorish cows 672
New Zealand cows 648
Ontario cows 553, 558, 561, 563, 566, 567, 569, 570
Prince Edward Island cows 575
Quebec cows 573
Russian cows 520, 525
Syrian cows 654
Buying foreign cattle, best manner, time, place, &c. (*See* Purchasing cattle.)
Byers, S. H. M., consul at Zurich:
Report on Brown Schwitzer cattle 298–303
(As milkers, 298–301; characteristics, feeding, and caring, 301; Brown Schwitzers in the United States; market value of, 302; how to export, 303.)
Cadiz, province of 385–387
(Area of pasture lands, 386; census of cattle, 387; topography, soil, climate, and grasses, 385.)
Calves, rearing, &c.:
Hereford 197
Jersey, on the island of Jersey 116
In France 271, 273, 275
Switzerland 296
Welch 154, 155
Calw, price of cattle in 454
Camarque cattle, used for bull-fighting only 271
Campbell, Robert C., consul at Monterey:
First report: Cattle in the State of Nuevo Leon 587–589
(Topography and cattle of Nuevo Leon, 587; native preferred to foreign cattle; milk, butter, and cheese; cattle exports to the United States, 588; census of cattle; an energetic dairyman wanted, 589.)
Second report: Stock-raising in the State of Nuevo Leon 589–592
(Sheep-farming, goat and hog raising, 590; horse, mule, and burro raising, 591.)
Canada. (*See* Dominion of Canada.)
Canadian cattle, native:
Bred out in Ontario 540
Characteristics 539
Good qualities of 571
vs. Jersey 572
Blooded breeds superior to British 556
Cattle companies in the United States 537
Cantal Mountains, dairying on 251, 252

Page.

Cape Colony:
Breeds of cattle in; characteristics of:
Africander 669
Devons, Friesianders, Jerseys, Kerrys, Mixed, Shorthorns 670
Cattle, census of 670
Imports of dairy products into 670
Care of cattle in Europe and in the United States 42, 43
Carlton County, Ontario 568, 569
(Cattle statistics of, 569; topography, soil, production, &c., 568.)
Carricarte, J. de, consul at Corunna:
Report: Cattle in Galicia 388
(Topography; housing; feeding; breeding; herding; products; stock; how to export to the United States.)
Carrington, W., King Mills, on Guernsey cattle 125
Castrating cattle in Mexico 579
Catalonia (beef, milch cows, sheep, pork) 387
Catlin, George L., consul at Stuttgart:
Report: Cattle-breeding in Wurtemberg 444–464
(Census of cattle; Simmenthal breed, 444; Montefoner and Allgauer breeds, 446; Limburger and Neckar breeds, 447; prices and weight of cattle; cattle-breeding at the agricultural school at Hohenheim, 448; stabling, feeding, and breeding; bull-keeping at Kirchheim under Teck, 450; cattle-breeding at Rottweil 451; cattle-breeding at Kirchberg and Ravensburg, 452; cattle-breeding at Heidenheim; cattle trahsport via the St. Gothard Tunnel, 453; cattle trade at Calw; cattle fairs; climate of Wurtemberg, 454; soil, distribution of area, and meat supply of Wurtemberg, 455; meat prices at Stuttgart; dairy association at Aichstetten, 456; dairy association at Algan, 457; dairy association at Heldenfingen, 469; area under cultivation; percentage of products, 463; characteristics of Wurtemberg cattle, Simmenthal, Allgauer, and crossings, 464; dairy association laws of Wurtemberg, 691–694; Wurtemberg cattle laws, 743–752.)
Cattle-breeding:
At agricultural school (Government), Hohenheim 448–450
Heidenheim 453
Kirchberg 452
Ravensburg 452
Rottweil 451
Experimental; Red Polls 92
From imported stock in Switzerland, results 321
Thuringia, results 441
General information, by an English expert 81–86
In Brazil 632
Cape Colony 669
Ceylon 655
Denmark 492–495
Ecuador 634
Europe 22
Europe and the United States, contrast 41–54
Galicia 388
Germany 397, 398
Baar 472
Baden 466
Bavaria 478
Harz Mountains 483
Marshes 415
Oldenburg 421
Silesia 493
Thuringia 440
Holland 514
Honduras 593
Hungary 527, 531
Mexico ..... 578, 585, 59[illegible]
Ontario 547, 549, 550, 551, 559
Russia 524
Scotland ..... 209, 2[illegible]1
Switzerland 287, 304, 308, 323
Syria 652
Yang-tse-Kiang Valley 667

	Page.
Cattle-breeders	
American farmers at fault	51
Ayshire, experience of	138, 212
British prize	712, 715
Devon	109, 110, 192
Galloway, caution to	109, 110
Guernsey	125, 128
Hereford	183-188
Highland	145-147
Jersey	117, 123
Kerry	129-133
Longhorn	95, 199
Polled Angus	139-142, 193, 194, 209, 210
Red Poll	89-93
Shorthorn	69, 72-74, 99, 105-107, 189, 646
Sussex	114-116
Welsh	153-156
Cattle fairs (*see also* Cattle shows):	
In England and Scotland	170, 182
Germany, Mosskirch	468
Silesia	434
Wurtemberg	454
Cattle improved by transference to foreign countries	505
Insurance companies in Germany	402
Laws of Mexico	585
Wurtemberg	742-752
Market, British	696-699
Neuss	488
Products from Dutch cows in Silesia	437
Handling in Thuringia	440
Imports of American, into Mexico	581
Shorthorn dairy, sale of	103
Supply of Barmen	399
Cattle sales, and prices realized thereat:	
Auld's, R. C. (Polled Angus)	76
Aylmir's, Sir Hugh, West Durham	76
Barnaby Manor, Hereford	76
Castle Hill, Cerne	158
Cooper's, Connecticut	645
Dunmore's, Earl of, Highlands	76
Halford's, Mr. T. (Shorthorn), Sherbono	76
Halker (Shorthorn)	76
Jersey cattle	76
Kellog Combination, New York	645
Knight's, Thomas (Sussex)	76
Knightley's (Shorthorn)	101
Lovatt's Henry (Shorthorn), Wolverhampton	76
New York Mills, New York	158
Pitt's (Hereford)	177
Platt's (Hereford), Newark	76
Turner's (Hereford)	178
Cattle shows (*see also* Cattle fairs):	
In England	50, 54, 170, 180, 195
Dairy, London	720
France	266, 720
Germany	416, 453
Ontario (Toronto)	555
Scotland	170
Switzerland	307, 308
Cattle trade of Ireland	225
United States, exports	4, 25
Cattle *vs.* sheep in the Argentine Republic	612
Census, cattle:	
All countries: European	10, 400
Non-European	12

Census, cattle—Continued. Page.
Argentine Republic 12, 605, 617
Australasia 12
New Zealand 642
Tasmania 650
Austria 10, 400
Belgium 10, 232, 397, 400
Brazil 12, 630
Canada, Dominion of 12
Ontario 538, 556
Ayshires 543
Blooded stock 542, 556
Chatham district 561
Devons 543
Hastings County 566
Herefords 543
Jerseys 543
Polled Angus 543
Shorthorns 543
Simcoe district 570
Cape Colony 670
Denmark 10, 400, 491
Ecuador 635
Europe. (*See* all countries.)
France 10, 232, 266, 268, 400, 724
Bordeaux district 281
Germany 10, 232, 399, 400, 408
Baar district 470
Baden 471
Brunswick 481
Hesse-Darmstadt 486
Hesse-Nassau 389
Marshes 414
Neckar cattle 473
Odenburg 414
Prussia 390, 399
Rhine Province 400
Saxony 429
Silesia, and distribution 437
Thuringia, and distribution 441
Westphalia 400
Wurtemberg 444
Great Britain 10, 400
Holland 10, 232, 400, 508, 517
Honduras 602
Hungary 10, 400, 532
Ireland 10, 80, 225, 227, 232, 400
Italy 10, 400
Piedmont 330
Terra di Lavoro (buffalo) 327
New Zealand 642
Norway 10, 400
Portugal 10, 400
Russia 10, 400, 521, 522
Scotland 80, 214, 223
Spain 10, 400
Province of Cadiz 387
Sweden 10, 400
Switzerland 10, 321, 400
United Kingdom 10, 80
United States 12
Colorado (Polled Angus) 208
Uruguay 12, 635
Wales 80
Yang-tse-Kiang Valley 667

Census, cattle—Continued. Page.
Domestic animals in Bavaria 753, 754
Cadiz 387
Horses in Saxony 431
Live stock in Bavaria 709
Saxony 430
Sheep in Argentine Republic 625
New Zealand 642
Uruguay 625
Central Chamber of Agriculture, England 722
Centrifugal butter-making in Switzerland 315
Ceylon:
American *vs.* Danish and French butter in 677
Buffalo cattle of 658
Cattle-breeding in 657
Imported cattle in 657
Origin and history of Singhalese cattle 656
Characteristics of cattle (color, form, points, and general description):
Belgium:
Ardennaise, Charleroi, Flechet, Furnes-Ambacht 361, 368
Flemish 368
Holandais (Dutch) 367
Brazilian 630, 631
British:
Ayrshire 63, 135, 168, 200, 211, 212, 220, 740
Devon 57, 108, 157, 159, 191, 739
Galloway 63, 148, 150, 153, 194, 195, 209, 210, 218, 219
Guernsey 64, 128
Hereford 58, 110, 161, 174, 199
Highland 63, 143, 196, 212, 218
Jersey 64, 116, 167, 200, 205, 206
Kerry 65, 129–133
Longhorn 60, 95, 96, 199
Polled Angus 62, 87, 139–142, 163, 165, 193, 219
Red Polled 61, 71, 87, 162, 163, 196
Shorthorn 59, 98, 99, 157
Sussex 61, 72, 114–116
Welsh 65, 153, 155, 166, 198, 742
Canadian native breed 539, 540, 563
Blooded 558, 563, 564
Prince Edward Island 575
Chinese, Yang-tse-Kiang Valley 666
Danish 490, 492
Dutch 367, 392, 404, 411, 503, 515
French:
Algerian 257
Aubrac 258
Bazadais 255, 274
Bordelais 276
Brittany 245
Camargue 271
Charolaise 248
Comtoise 250
Femeline 250
Flemish 241
Garonnais 254, 272
Gascon 257
Landaise 277
Limousin 248, 278
Mancelle 249
Normandy 243, 282
Parthenaise 247
Pyrenean 257
Salers 251

Characteristics of cattle, &c.—Continued. Page.
German:
Alb ... 392
Allgauer ... 394, 464
Angeln ... 395
Baar ... 468, 472
Bavarian ... 475
Birkenfeld ... 487, 489
Brunswick ... 482
Dutch ... 392
Eifel ... 488, 489
Glan ... 439
Harz ... 480
Heilbronner ... 439
Messkirch ... 465, 472, 473, 474
Miesbacher ... 393
Montafoner ... 393, 405, 446
Neckar ... 447, 473
Odenwald ... 471
Pinzgauer ... 393
Schwab Hall ... 392
Schwitzer ... 394, 405
Silesian ... 435
Simmenthal ... 391, 445, 464
Triesdorf (misspelled *Friesdorf*) ... 392
Voightland ... 395, 443
Westerwald ... 487, 489
Hungarian ... 529, 530, 536
Italian:
Buffalo of Naples ... 327
Venetian ... 356
Java buffalo ... 602
Malaysian buffalo ... 661
Moorish ... 672
Russian ... 523
Seychelles ... 673
Sierra Leone ... 671
Singhalese ... 657
South African (Cape Colony) ... 669
Swiss:
Black Spotted Freiburg ... 291
Schwitzer ... 292, 301
Simmenthal ... 289
Syrian ... 652, 654
Venezuelan ... 638
Charleroi cattle ... 361
Charolaise cattle:
Characteristics ... 248, 724
Crossing with Herefords ... 248
Milking qualities ... 725
Work and meat qualities ... 248
Chatham, Ontario district:
Beef export from ... 502
Cattle-raising in ... 559
Prices of cattle in ... 562
Cheese:
American, exports of ... 20, 34
In Holland ... 510
Argentine ... 603
Canadian, in the United States ... 573
Bavarian ... 480
Cantal Mountain ... 252
Dairying in Hastings County, Ontario ... 566
Exports from France ... 262
Switzerland ... 317
United States ... 20, 34

Cheese—Continued. Page.
Imports into France ... 262
Saint Thomas ... 640
United Kingdom ... 20, 36
Laticini, from milk of buffalo cattle ... 327
Manufacture:
In Hungary ... 531
In Italy ... 677–681
(Gruyera, Rubiole, Grana, Strachino, Formaggini, Emelian, Crete, Marzoline, 678; Mozarelle, Bellunese, Fieno, 679; Caociocavallo, Rasco, 680; Sicilian, Proratura, 681.)
In Ontario ... 544, 567
In Switzerland ... 315, 682, 685
(Emmenthal, Gruyère, 682, 684; Spalen, Appenzell, Schnabziger, Formaggio della Paglia, Battlematt, Gessenay, Vacherin, 683, 684; Urseren, Cristallini, Bellelay, Valais, Praettigan, Vaud, Tomme, Blocler, 684.]
Mexican ... 576, 588, 593
Price of imported, in the English market ... 20
Sheep's milk, of Tuscany ... 678
Syrian ... 653
Thuringian ... 441
Vicenzan ... 844
Yield from milk of (*see also* Special statistics):
British cows:
Ayrshire ... 75, 138, 168, 171, 200, 212, 216, 219
Devon ... 75, 159, 160, 192
Galloway ... 75, 195, 216
Highland ... 75, 197, 216
Longhorn ... 75, 97, 190, 199
Polled Angus ... 75, 194, 216
Red Polled ... 163
Shorthorn ... 75, 216
Sussex ... 75, 198
Welsh ... 75, 198
French cows ... 252
German cows ... 424, 435, 464, 472, 483, 489
Italian cows ... 328, 229, 333, 353
Hungarian cows ... 535
New Zealand cows ... 650
Ontario cows ... 553, 561, 563, 566, 567, 569, 570
Prince Edward Island cows ... 575
Quebec cows ... 573
Russian cows ... 520
Swiss cows ... 322
Cheney, F. M., consul at Zanzibar:
Report: Cattle in Zanzibar ... 672
Chesney, P., on Kerry cattle ... 131
Chianina cattle of Tuscany ... 330, 334
(Characteristics, weight, value, feeding, housing, transportation to United States, &c.)
Chihuahua. (*See* Mexico.)
China:
Southern China, cattle in ... 608
Yang-tse-Kiang Valley:
Breeds of cattle in ... 605
Cattle-breeding in; census of cattle ... 607
Export of cattle to the United States ... 667
Housing and feeding cattle in ... 600
Topography, climate, &c ... 604
Water Buffalo of ... 666
Cholmogorian cattle:
Characteristics, feeding, milk yield ... 520, 524
Clanchy, J. J., report on the butter trade of Cork ... 231–235
Clay, John, jr., on careless Canadian cattle-farming ... 540
Climate of:
Brazil ... 632
Ceylon ... 658

	Page.
Climate of—Continued.	
China, Yang-tse-Kiang Valley	664, 665
Colombia, United States of	633
Dominion of Canada:	
Ontario	545, 554, 558, 566, 568, 570
Prince Edward Island	575
Quebec	571
Ecuador	634
France	269–271
Honduras	597
Italy, effects of, on imported cattle	353
Terra di Lavoro	328
Tuscany	334
Venetia	356
Mexico:	
Chihuahua	586
Northern Mexico	584
Tamaulipas	564
San Domingo	640
Sierra Leone	671
Spain:	
Andalusia	395
Syria	654
United Kingdom:	
England:	
Devonshire	171, 192
Herefordshire	162, 171
Jersey	168, 171
Norfolk	164, 171
North Devonshire	160, 192
Suffolk	164, 171
Sussex	161, 171, 198
Yorkshire	158, 171
Ireland	228
Scotland	217, 221
Aberdeenshire	166
Ayrshire	169, 171, 200
West Highlands	217
Wales	198
Anglesea	166
Uruguay	622
Venezuela	638
Clossett's, Dr., system of preserving meats and vegetables fresh	370, 699
Coahuila, cattle of	584
Colombia, United States of	633
(Cattle, foreign and native; cattle pest and spider; climate, feeding, topography, &c.)	
Color of cattle. (*See* Characteristics.)	
Comtoise cattle, characteristics of	250
Condensed milk:	
Export of Swiss	312
Manufacture in Switzerland	312
United States	313
Co-operative factory system of dairying in England	719
(*See also* Associations.)	
Cooking meat in Honduras	602
Cork, butter trade of	231
Cornwall, England, cattle in	207
(Topography, soil, feeding, housing, &c).	
Cost of:	
Fattening cattle in France and the United States	264
Introducing and keeping cattle in Bordeaux	281
Keeping cows let out to laborers in England	107
Producing fine cattle in England	43
Transporting cattle to the United States. (*See* Transportation of cattle to the United States).	

Page.
Cotswold cattle (Shorthorns) 74
Sheep in England. (*See* Sheep.)
Counterfeiting American products in Belgium 869
Cows:
Abbey Farm Shorthorn 73
Ayrshire, "Bright Smile" 224
Belgian, milking qualities 874
Dairy, feeding at Munster Dairy School 48
Devon, Myrtle (milker) 75; Pretty Face, 149; Myrtle, 192; Phlox, 739.
Draft, in Thuringia 439
Dutch, Wentje and Susette, milk record 511
Exercise for 49
Galloway, Lalla Rookh 224
Guernsey, Vestas, 1, 2, and 3 125
Celebrated herds in Sussex 127
Hereford, Giantess, 60; Dolly Varden and Success, 179.
Jersey, Mary Ann of St. Lambert and Oaklands Cora 557, 559
Signs of purity of breed 116
Letting out, to laborers in England 107
Mexican, breeding, for the United States 580
Milch, Belgian 371–374
Milk. (*See* Milk yield.)
Norman, suitable for export to the United States 285
Polled Angus, Juno and Sybil, 238; Tillifour, Pride, 5th, 194 .....
Pregnant, feeding 48
Red Polled, Dolly, Silent Lady, Davy 27th, 88; Davy 24th, Nancy 3rd, Pet, Tulip, Empress, Sultana, Primrose, Wild Rose of Kilburn, Silent Lass, 90; Cheerful, 91.
Shorthorn, Gerty and her decendants, Lady Playful, Lady Alicia, Lady Pamela, Lady Pamela 2nd, Glad Tidings, Lady Carew 9th, Gratification, Lady Gracious, Lady Laura, 105; Lady Carew 3rd, 735; Victoria, Maiden, April Rose, 736; Baroness Oxford 3rd, Matchless 5th, Generous, Red Cherry, 737; Innocence 2nd of Neseby, 738.
Swiss:
Herd of Charles Kuhne 319, 320
Mr. Page 209
Monastery of Einsedeln 300
Crain, Dunham J., consul at Milan:
First Report: Cattle and dairying in Lombardy 324–326
(Swiss cattle in Lombardy, 324; cattle breeds of Northern Italy, 325; portraits of Italian cattle, 326.)
Second Report: Cheese and butter-making in Italy 677–682
(Cheese-making, 677–681; butter-making, 681, 682.)
Cream:
Percentage of yield, Shorthorn dairy 103
Jersey cows 123
Separating machines 688–691
Yield in Jersey 120–123
Crosby, J. Schuyler, consul at Florence:
Report: White cattle of Tuscany 334, 33
Cross-breeds:
British cattle:
Devon 159
Galloway 152, 211
Hereford 211
Kerry 133
Longhorn 96
Polled Angus 141, 201
Receipts from a Wiltshire dairy of 691
Shorthorn 70, 100, 728
In Belgium 361
Brazil 631
Colombia 633
France 244, 245, 246, 248, 249, 250, 252, 254, 257, 274, 728
Germany 418–481
Hungary, for dairy 127

Cross-breeds—Continued.	Page.
In Mexico	586
Morocco	672
New Zealand	648
Russia	524
Sierra Leone	671
Switzerland	291
Dairy Associations:	
Aichstettin, Germany	456
Algau, Germany	457
Belluno, Italy	341
Denmark, "union"	498
England, "co-operative"	719
Heidenfingen	460
Silesia	433
Wurtemberg	456
Dairy cows:	
Feeding, at the Munster Dairy School	48
Improvement of British	717
In Quebec, Jersey *vs.* Native	572
Treatment of, in Ontario	545
Dairy farming:	
Position of English	716-720
In Ireland	235
New Zealand	649
Silesia	433
Dairy herds, how to farm and handle	101
Dairy instruments:	
Cream separators	685-691
Scientific	685-688
Dairy machines exhibited at Ghent Agricultural Fête	371
Dairyman wanted in Nuevo Leon	589
Dairy products:	
Consumption of, in Rio de Janeiro	631
In Europe	14-21
Imports of, into Cape Colony	670
Hamburg and Bremen	423
Dairy record, wonderful Shorthorn	103
Dairy, returns of a Wiltshire	691
Dairy school, Government, in Silesia	433
Dairy school, Munster, Ireland	48
Dairy Shorthorns, value of, as dairy cattle	102
Dairy show, London, milking trials at	720
Dairy stock, treatment of, in Ontario	545
Dairy tests, London	202
Dairying:	
In Aveyron	253
Bavaria, cheese	480
Belluno	341
England, co-operative	719
Hungary, cross-breed	527
Lombardy	324
Malaysia	660
Padua	357
Terra di Lavorno, buffalo cattle	321
Udine	337
Vicenza	343-346
On Cantal Mountains	251
High Alps	311
Danish *vs.* American and French butter in Ceylon	677
Danish *vs.* French, Dutch, Belgian, and American butter in the English market	13, 496
Darwin:	
Droughts in the Argentine Republic	609
Counting cattle in the Argentine Republic	611
Curious breed of cattle on the Upper Uruguay River	616
Grasses of the Argentine Republic	610

Page.
Davy, Col. J. J., on Devons as milkers 159
Decrease of stock in Scotland 215
Degeneration of cattle 51
De la Perelle, George, on transportation of British cattle to the United States 169
Denchfield, Edward, Buckinghamshire, on Shorthorn stock 73
Denmark:
Breeds of cattle in:
Black spotted Jutland 490
Red Danish (Angeln) 490, 492–495
Census of cattle 10, 490, 491, 493
Danish cattle for the United States 491
Exports of butter from 495–498
Cattle from 491
Union dairies in 498–501
Description of cattle. (*See* Characteristics.)
Devon cattle:
Characteristics 57, 108, 157, 159, 191, 739
Cow, Phlox 739
In Canada 539, 550, 553, 556, 558
Cape Colony 670
New Zealand 647
Milk yield 75, 159, 160, 161, 171, 192, 202
North Devons 72
Origin and history 57, 107, 158
Price of 75, 86, 208
Somerset Devons 70
Varieties of 108
Weight of 72, 74, 109, 110, 160, 164, 171, 180, 192, 201, 203
Devonshire, topography, soil, climate, cattle-raising, &c 160, 191
Dezeyk, A. J., vice-consul at Turin:
Report, Cattle in Piedmont 329, 330
(Breeds: Milk, cheese, and butter yield; weight, topography, soil, housing, transportation to the United States, &c., 328; cattle census of Piedmont, 329.)
Disease, cattle:
Foot and mouth, in Ireland, ravages of 224
In Mexico 583
On the plains of Bogota 633
Plague in Java and Sumatra 662
Distillery-fed cattle in Canada for export 565
Dithmar, Henry, consul at Breslau:
Report, Silesian cattle 431–438
(Introductory, 431; area, climate, soil, topography, cattle-feeding, 432; housing, breeding, and dairy farming, 433; cattle fairs in, and cattle imports and exports of Silesia, 434; census and statistics of cattle in Silesia, 435; imported and favorite breeds in Silesia, 436; products from Dutch cows, and census and distribution of cattle in Silesia, 437.)
Division of land in France 206
Dockery, A. V., consul at Leeds, transmitting a report on Herefordshire and Hereford cattle by John Kersly Fowler 181
Dominion of Canada:
Ontario:
Beef exports from Chatham 562
Breeds in:
Ayrshires 539, 549, 556, 563, 570
Devons 539, 550, 553, 556, 558, 561
Galloways 539, 557
Herefords 539, 549, 564
Holsteins 538, 552, 556
Jerseys 538, 551, 557, 558, 564
Native cattle 539, 540, 556, 564
Polled Angus 538, 540, 543, 557, 561
Shorthorns 539, 542, 547, 553, 555, 556, 564, 566, 567, 569, 570
Breeding in the Chatham district 559
British breeds, relative value of 538, 539
Census of blooded cattle in Ontario 542

Dominion of Canada—Continued. Page.
Ontario—Continued.
Census of all cattle in Ontario 558, 556
Census of cattle in Chatham district 561
Cheese-making in Hastings County 567
Climate of Ontario 545, 554, 558, 564, 578
Distillery-feed cattle for export to England 565
Eastern Ontario, cattle in 556
Exports of cattle from Prescott to the United States 565
Feed, cattle, relative value of 561
Imports of cattle from the United State not probable 563
Import of full-blooded cattle into Hastings County 566
Prices of cattle in Chatham 562
Special cattle statistics 553, 556, 563, 566, 567, 569, 570
Topography, soil, &c 554, 558, 564, 566, 568, 569
Transportation of cattle to the United States 543
Yield of different breeds of cattle 553, 558, 561, 562, 566, 567, 569
Quebec:
Eastern Townships:
Breeds most suitable for Quebec 572
Climate 571
Dairy cattle, best 571
Disposition of cattle and products 573
Fodder 571
Native or French cattle 571
Jerseys *vs.* native cattle 572
Special cattle statistics 573
Topography, housing, feeding, &c 574
Gaspé Basin, district cattle and products 574
Prince Edward Island cattle 574
Export of product to Boston 574
Special cattle statistics 575
Topography, housing, feeding, &c 575
Donner, Herman, vice-consul at Helsingfors:
Report: Cattle in Finland 525
(Breeds, characteristics, weight, product, topography, soil, housing, &c.)
Donnersberg cattle 485
Dorsetshire butter 176
Driving cattle:
In Argentine Republic 609
Mexico 581, 588
Drought, effects of, on cattle raising in Mexico 592
Duckham, Mr., on Hereford cattle 173, 174
Duffryn herd of Shorthorns, history, yield, &c 69
Dumfries, Courier (Scotland), "Caution to Galloway Breeders" 45
Duncan, James, Benmore, on Highland cattle 146
Dutch cattle (*see also* Holland cattle):
In Belgium 367
Germany 392, 393, 396, 411
Silesia, products of 437
Misnamed in the United States 504
Prices of 396, 505, 516
Suitableness of, for export 505
And Flemish cows, milk yield of 378
Duties, cattle:
In Honduras 599
Mexico 580, 582
Earl of Cawdor, on Welsh cattle 155
Earl of Coventry on Hereford cattle 161
Earl of Seafield on Highland cattle 146
East Friesland:
Climate 413
East Frisian cattle 408, 420, 421, 423, 436
Feeding cattle in; grasses 409
Housing cattle in 425
Special cattle statistics: Weight, yield, &c 424

Page.

Eckstein, D., consul at Amsterdam:
Report: Dutch cattle 502–514
(Hunting up cattle statistics in Holland, 502; distribution of breeds in Holland, 503; misnaming Dutch cattle in the United States; percentage of the several breeds in Holland, 504; improvement of breeds by transference to foreign homes; best Dutch cattle for export; prices of Dutch cattle, 505; transportation to the United States, 506; cattle census of Holland, 508; decrease and exports of Dutch cattle, 509; imports of live stock, American meat, cheese, butter, and oleomargarine, 510; milk-yield of Dutch cows, 511, 512; topography and soil of Holland, 513; substratum, housing, feeding, breeding, 514.)
Ecuador:
Census of cattle, milk yield, seasons in 634
Profits of cattle-raising in; grasses, soil, and climate 635
Special statistics of cattle 635
Eifel cattle:
Characteristics, weight, yield, &c 489
Price of 488
Einsedeln cattle, characteristics, yield, &c 306, 307
Elberfeld abattoir, statistics of 401
Elwes, H. T., on Cotswold sheep 762
Encouragement, Government:
Of cattle-breeding:
In Europe 53
Hungary 528
Ontario 564
Of fresh meat exports from Uruguay 626
England:
American *vs.* English fresh beef in 8
Breeds of cattle in:
Ayrshire 134, 199, 740
Devon 57, 72, 74, 107, 158, 191, 739
Galloway 62, 147, 194
Guernsey 124–129
Hereford 58, 72, 110, 161, 172, 182, 190, 739
Jersey 116, 166, 200, 741
Kerry 129
Longhorn 60, 94–97, 199, 739
Polled Angus 62, 139, 193
Red Poll 61, 70, 71, 86, 162, 196
Shorthorn 59, 69, 70, 72, 73, 157, 188, 735
Suffolk 739
Sussex 61, 72, 114, 160, 197, 740
Welsh Runts 65, 153, 166, 198, 742
West Highland 63, 143, 196
Of pigs in 760–762
Of sheep 755–760
Breeding cattle in 81–88
British cattle and cattle products 79–81
Cattle markets 696–699
Prize cattle. (*See* Prize cattle.)
Cattle shows in 50, 54, 170, 180, 195
Central Chamber of Agriculture 722
Cost of producing fine cattle in 43
Cotswold sheep in 762
Dairy farming in, condition of 716–720
Dutch cattle imported into in 1640 ..... 98, 366
Milking trials at dairy shows in 720–722
Milk record of 60 English cows 715, 716
Prize breeders of British cattle 712–715
Sheep and mutton in, 1883 782–788
Southdowns and Cambridgeshire farming 773–777
Southdown sheep, history, breeding, and management 763–772
Stock feeding in 83–85
Weights of English sheep 778–782

Page.
Estancias, cattle, in the Argentine Republic....609, 611, 612, 619
(From estancio to slaughter-house; requisites of an estancia, 609; number of animals an estancia will maintain; how the stock is herded, 611; cattle *vs.* sheep on; marking young animals, and feasting thereat, 612; capital required to start an estancia, 619.)
Europe:
Care of cattle in *vs.* the United States.... 42
Census of cattle in.... 10, 400
Dairy products in.... 14, 21
Government aid to cattle-breeders in.... 53, 528
Increasing demand for fresh beef in.... 13
Origin of cattle of.... 390
Production and consumption of cattle in.... 10, 11
Exhibition of:
French live stock at Paris.... 729-734
Thuringian cattle at Heilbronn.... 453
Experimental cattle-feeding in France.... 277
Ontario.... 47
Exports—
Beef:
American to Belgium.... 364
Fresh to all countries.... 13, 28, 37
Salted, canned, &c., to all countries.... 37
From Chatham, Ontario.... 562
Uruguay.... 623
Butter:
American.... 30
Danish.... 491, 495, 498
Swiss.... 315
Cheese:
American.... 34
Swiss.... 317
Cattle:
American:
To all countries.... 4, 22, 25
To Belgium.... 364
To Bordeaux.... 279
British.... 77
Canadian, distillery fed, to England.... 565
Fancy Jerseys to the United States.... 557-559
Products from Argentine Republic.... 606
Lower California.... 596
Quebec to the United States.... 573
Sierra Leone to the United States.... 671
Switzerland.... 287
United States.... 4, 22, 28, 30, 34, 37, 39
Duties and taxation, cattle:
Honduras.... 599
Mexico.... 582
Fresh meat from Uruguay, Government guarantee on investments for developing.... 626
Hides: From Lower California to the United States.... 596
Sierra Leone to the United States.... 671
Yang-tse-Kiang Valley.... 667
Oleomargarine from the United States.... 19, 39
Tallow from the United States.... 21, 39
Extract of beef, Liebig's factory in Uruguay.... 624
Fairs. (*See* Cattle fairs.)
Farmers' Journal (London), "Cattle Statistics".... 43-45
Farming: In Belgium.... 705-708
England, dairy, position of.... 716
Southdowns and Cambridgeshire.... 773
Farrington, Harry, an American, establishes factory cheese-making in Ontario.... 544
Fat stock in France, prize, cattle show.... 729
Fattening American cattle in England.... 49
Calves in Jersey.... 119
Cattle in France.... 284

Page.
Fattening cattle in Germany 406
Oxen in Germany, statistics relating to 407
Oxen in Ontario, experiments 47
Faulkner, Joseph Lay, veterinary surgeon:
Report on British cattle 188-205
(Shorthorns, 188; Herefords, 190; Devons, 191; Polled Angus, 193; Galloways, 194; Red Polls, 196; Highland, 196; Sussex, 197; Welsh cattle, 198; Longhorn, 199; Jerseys, 200; meat producers, 201; special excellences, 203; recommendations, 204; prices of, and how to select, 205; weights and milk-yield of British cattle, 74.)
Feeding cattle. (*See also* Special statistics.)
In Ayrshire 136
Baden 467
Bavaria 477
Belgium 363
Brazil 632
Cornwall, England 207
Denmark 492
East Friesia 409
England, cost of feeding fine cattle 43-50
Improved method, dairy 717
France 254, 263, 277, 383
Germany 406, 407, 444-446, 466, 467
Hars Mountains 483
Hohenheim Agricultural School 450
Holland 514
Hungary 531
Italy 329, 331
Jersey 207
Calves 119
Mexico 577
Morocco 672
New Zealand 650
Normandy 283
Piedmont 329
Oldenburg 410, 421, 425
Ontario, experimental 47
General 544, 558, 564, 565, 566, 568, 570
Prince Edward Island 575
Quebec 571, 574
Rhine province 488
Russia 520, 524
Schleswig-Holstein 411
Scotland 216, 221
Sierra Leone 671
Silesia 432, 434
Spain (Galicia) 388
Syria 654
Switzerland 296, 301, 323
Terra di Lavoro, Italy 329
Thuringia 440
Tuscany 331
United Kingdom 88, 173
Yang-tse-Kiang Valley 660
On the soiling system 701-703
turnips 48
Femeline cattle 250, 725
(Characteristics, milking qualities, weight, price, &c.)
Field, newspaper:
On French cattle 729-734
Southdown sheep and Cambridgeshire farming 773-777
Finland, Ayrshire cattle in 535
(Special cattle statistics; topography, soil, climate, grasses, &c.)
Fisk, J. R., Isle of Wight, on Jersey cattle 123
Flechot cattle, Belgium 363

Flectret, François, St. Jean Sart, Aubel, Belgium: Page.
Report: Farming in Belgium ... 705–708
Flemish cattle:
Bulls, selection of ... 242
Characteristics ... 241, 368, 504, 515, 724
In Belgium and France ... 368, 378
Milking qualities ... 242, 724
Origin ... 240
Sub-Flamandes ... 243, 244
Food, cattle:
Analysis and comparative values of, in Germany ... 444–446
Analysis and comparative values of, in Italy ... 350
Cost of, in Tuscany ... 332
Distillery, in Canada ... 565
In Jersey ... 119
Quebec ... 571
Mixed, relative cost and value ... 703, 704
Of Lord Braybrook's herd of Jerseys ... 122
Pregnant animals ... 48
Shorthorn dairy cows in England ... 104
Young stock ... 83
Prices of, in England ... 42–50
Relative values of ... 46, 84, 561
Turnips ... 48
Food, human; consumption of, in French cities; consumption and supply in France; deficit in France and whence supplied ... 262
Form of cattle. (*See* Characteristics.)
Forster, Mr., Kent, on Sussex cattle ... 114
Fowler, E. P., Southampton, butter yield from Jerseys ... 167
Fowler, John Kersley, Prebendal Farm, Aylesbury, England:
Report: Herefordshire and Hereford cattle ... 181–188
(Description of Herefordshire, 181; the great cattle fair at Hereford; history of Hereford cattle, 182; Herefords as dairy cattle, 186; Herefords in foreign countries, 187.)
Fox, Howard, consul at Plymouth:
Report on cattle in Cornwall ... 207
Fox, William C., consul at Brunswick:
First report: Cattle in the Duchy of Brunswick ... 480–482
(Breeds of cattle in, 480; feeding and housing, and special statistics of cattle, 481; prices, weight, and characteristics of cattle; topography, soil, grasses, &c., 482.)
Second report: Harz cattle for export to the United States ... 482, 483
(Price, 482; transportation to the United States; special statistics, &c., 483.)
France:
Breeds of cattle in:
Algerian ... 257
Aubrac ... 253, 727
Barétone ... 257
Bazadaise ... 255, 274, 724
Bearnaise ... 726
Brittany ... 245–247, 728
Charolaise ... 248, 724
Comtoise ... 250
Femeline ... 250, 724
Flemish ... 240–242, 724
Garonnaise ... 254, 272
Gascon ... 257, 724
Landaise ... 256, 277
Limousine ... 248, 278, 726
Mancelle ... 249
Normandy ... 242–245, 282, 724
Parthenaise ... 247, 727
Salers ... 250, 727
Tarentine ... 726

France—Continued. Page.
Breeds of cattle in—Continued.
Mixed:
Aubrac ... 253
Bordelais ... 272, 276
Brittany ... 246
Charoloise ... 248
Flemish ... 243
Garonnaise ... 254, 274
Mancello ... 249
Miscellaneous ... 257, 258, 726–728
Normandy ... 243, 245
Parthenaise ... 727
Salers ... 252
Cattle feeding in ... 263
Census of cattle in ... 10, 232, 266, 268, 400, 724
Cost of fattening cattle in, and in the United States ... 264
Division of land in ... 266–268
Fat stock in (Paris show, 1873) ... 729–734
Fattening cattle in, ... 264
Food consumption, and deficits of, and whence imported ... 262
How to purchase cattle in ... 264
Imports and exports of cattle and cattle products ... 262, 271
Octroi duties in ... 260
Prices of meat in ... 262
Physical features of, by districts ... 269
Sheep in ... 777
Special statistics of cattle, weight; milk, butter and cheese yield, &c ... 265
Suitability of French cattle for export to the United States ... 265
Freiburg cattle, black-spotted ... 291, 304
French *vs.* American butchers and butcher-shops ... 284
butter ... 16, 677
Friesland cattle ... 503, 515, 670
Frisbie, John L., consul at Rheims. Report: Cattle products in the district of the Marne ... 285
Frisian cattle ... 408, 417, 420, 421, 436
Frozen-meat trade of the Platte ... 625–629
Fuller, Valancey F., Hamilton, Ontario, on Jersey cattle, price, qualities, export to the United States, &c ... 551, 558
Furnese-Ambacht cattle ... 361
Galician cattle ... 388
(Weight, characteristics, housing, feeding, breeding, handling, products, price, how to export to the United States, &c.)
Galloway cattle:
Breeders, caution to ... 45
Characteristics ... 63, 148, 150, 153, 194, 195, 210, 218, 219
Cross-breeding qualities ... 152, 211
Herd book ... 211
In Canada ... 530, 557, 558
Meat of, in London market ... 151, 195
Product of ... 148
Milk yield ... 75, 148, 216, 219
Origin and history of ... 149, 210
Prices of ... 80, 150, 195, 205, 214, 222
Recommendations to American breeders ... 147
Weight of ... 149, 151, 153, 211
Garis, J. de, Rouvets, on Guernsey cattle ... 125
Garonnaise cattle:
Characteristics ... 254, 272, 725
Cross-breeds ... 254, 274
Census of ... 255
Feeding ... 254
Grazing country of ... 274
Milking qualities of ... 725
Meat product ... 274
Oxen ... 254

Garonnaise cattle—Continued. Page.
Raising calves ... 273
Weight ... 274
Working ... 273
Gascon cattle:
Habitat and characteristics ... 257, 725
Milking qualities ... 725
Sub-breeds ... 257
Geldrian cattle, characteristics of ... 504, 515
Geneva district ... 321–323
(Breeding from imported stock; cattle census; imports of meat cattle, 321; characteristics and special statistics, 322; housing, feeding, breeding, soil, climate, etc., 323.)
Geographical features of France ... 269–271
(Northeastern, Eastern, Northern, Western, and Central France, 269; Southwestern, Southern, and Southeastern France, 270.)
Geological character of:
British Islands ... 67
Buckinghamshire ... 73
Gloucestershire ... 74
Geological formation of Venetia ... 335
Germany:
Breeds of cattle in:
Alb ... 392
Allgauer ... 391, 394, 396, 398, 405, 406, 416, 438, 439, 446, 478
Angeln ... 395, 410
Ansbacher ... 478
Baar ... 468, 470, 472
Birkenfeld ... 487
Black Forest ... 470
Donnersberg ... 485
Dutch ... 392, 398, 404, 411, 436, 480
East Friesland ... 398, 408, 417, 420, 421, 436
Eifel ... 488
Elinger ... 478
Glan ... 439, 478
Harz ... 480, 482
Heilbroner ... 439
Hinterwalder ... 473, 474
Holstein ... 398, 436
Kelheimer ... 478
Landviehrasse ... 480
Limbourg ... 391, 417
Messkirch ... 464, 468, 473, 474
Miesbacker ... 393, 396
Montafoner ... 493, 405, 446
Munsterland ... 398
Murzthaler ... 396
Neckar ... 391, 447, 471, 473, 474
Odenwald ... 471
Oldenburg ... 415, 418, 419, 420, 436, 480, 524
Pinzgauer ... 393, 478
Podolian ... 395
Polled Angus ... 430
Scheinfelder ... 478
Schwab Hall ... 392
Schwitzer ... 394, 405
Shorthorn ... 419
Simmenthal ... 391, 404, 414, 478
Triesdorf (misspelled Friesdorf) ... 392
Vogelsberg ... 485
Voigtland ... 395, 442, 478
Westerwald ... 487
Census of cattle in ... 10, 232, 399, 400, 408
Cattle insurance companies in ... 402
Cattle slaughtering in ... 400
Exports of cattle to the United States ... 396
Fattening cattle in ... 406, 407

Germany—Continued. Page.
Herd books in ... 397
Importation of American cattle into ... 403
Improvement of cattle in ... 396
Prices of cattle in ... 396, 407
Gibbs, Sir B. T. Brandreth, on prize breeders of British cattle ... 712
Gillespie, Rev. Mr., on Polled Angus and Galloway cattle ... 149
typical Galloways ... 219
Glan cattle in Thuringia ... 439
Glover, John B., consul at Havre:
Report on Normandy cattle ... 282-285
(Normandy, situation, soil, climate; characteristics of cattle, 282; Norman cattle preferable to Jerseys; Normandy butter; milking qualities of cows; feeding and herding cattle in, 283; beef cattle and value of beef; French *vs.* American butchers; importation of American cattle into Havre, 284; exportation of cattle to the United States, 285.)
Glynn, Rev. W. A., on Guernsey cattle ... 126
Goats:
In Nuevo Leon ... 500
Saxony ... 431
Good, Richard, on the best cattle to export from Ireland to the United States ... 226
Government aid to cattle-breeders:
In Hungary ... 523
Ontario ... 500
Government aid to meat exporters in Uruguay ... 626
Government encouragement to stock-breeders in Europe ... 53
Grading meats in Lille, London, and Paris ... 260, 261
Grasses cultivated in—
Andalusia ... 385
Bavaria ... 477
Cornwall, England ... 207
Ecuador ... 635
Hungary ... 530
Ireland ... 228
New Zealand ... 650
Ontario ... 551, 558, 564, 566, 570
Quebec ... 574
Rhine Province ... 489
San Domingo ... 640
Scotland ... 217
Switzerland ... 322
United Kingdom ... 172
Grasses, natural, in—
Bermuda ... 639
Japan (sheep will not live on) ... 663
Mexico ... 577, 586, 593
Venezuela ... 638
Yang-tse-Kiang Valley ... 665
Grazing and pasture lands in—
France ... 263, 274, 276, 277, 278
Honduras ... 597
New Zealand ... 642
Oldenburg ... 414, 421
Sonora (range) ... 595
Syria ... 652
Tamaulipas (range) ... 592
Venezuela ... 638
Western Andalusia ... 386
Grazing cattle on the Alps ... 310
Griffin, G. W., consul at Auckland:
Report: Cattle of New Zealand ... 642, 650
(Pasture lands; census of sheep and cattle, 642; cattle quarantine regulations, 643; New Zealand cattle in the United States; New Zealand Herefords, 645; Shorthorns, 646; Polled Angus and Devons, 647; Ayrshires, Alderneys, and mixed breeds, 649; price of cattle; number of distinct breeds in; transportation to the United States, 649; special statistics, milk-yield, weight, characteristics and origin of cattle, soil, climate, grasses, &c, 650.)

	Page
Groningen cattle	508, 515
Guacho cattle-herders in the Argentine Republic	612
Guarantee granted by the Uruguayan Government for the export of fresh meat	626
Guernsey cattle:	
Bull, Squire of Vauxbelets	742
Characteristics of	94, 128
Cow, Elegante	742
Experience of breeders	125
In the Isle of Wight	126
Milk product of a Sussex herd	126
Milk record of a Guernsey cow	126
Milk yield	202
Notes by a Guernsey farmer	128
Origin and breeding	124
Price	80, 127
Weight	126
Guernsey:	
Breed of cattle in	94, 124
Guernsey cattle, by a Guernsey farmer	128
Gumbleton, Richard J. Maxwell, J. P., on cattle in Ireland and in the United States	226
Gwynn's, Shorthorn, herd of	70
Hall, Mr., on Polled Angus cattle	541, 542
Hampton, Wade, Sr.:	
Early importer of blooded cattle into the United States	51
Inaugurated the American jockey club	41
Handling cattle products in. (*See also* Special statistics.)	
Bavaria	478
Galicia	388
Jersey	207
Oldenburg	425
Ontario	564
Prince Edward Island	575
Scotland	216, 221
Terra di Lavoro, Italy	329
Harper, Joseph W., consul at Munich:	
First report: Bavarian cattle	475–490
(Bavarian work-cattle; topography and temperature of Bavaria, 475; soil and substratum, 476; cultivated grasses, housing, feeding, and breeding, 477; handling products; special statistics of Bavarian cattle, 478; cheese, 489.)	
Second report: Live-stock in Bavaria	709
(Number, value, and weight.)	
Harvey, Mr., editor of Herd-book, on Welsh cattle	168
Harz cattle:	
For the United States	482
Characteristics	480
Cost of transport to the United States	483
Housing, feeding, breeding, and handling products	483
Milk, butter, and cheese product	483
Prices of	483
Harz Mountains, cattle on	480
Hastings County, Ontario:	
Census and class of cattle	566
Cheese making in	567
Special cattle statistics of	567
Hatfield, Oscar, consul at Batavia:	
Report: The Java buffalo	661, 662
(The cattle plague and the means taken for its extinction, &c.)	
Haughwout, Frank G., consul at Naples:	
Report: Buffalo cattle of Terra di Lavoro	326–329
(Terra di Lavoro, topography, soil, cattle, &c., 326–328; export to the United States; special statistics of cattle in, 328, 329.)	
Havre, importation of American cattle into	264

Hazelton, J. F., consul at Hamilton, Ontario: Page.
Report: Cattle of Eastern Ontario 556, 559
(Census of cattle and favorite breeds, 556; export of fancy Jerseys to the United States; miscellaneous information, 557; special statistics, breed, weight, yield, characteristics, origin, topography, housing, feeding, &c.; Jerseys improved by importation, 558).
Heap, G. H., consul-general at Constantinople, on Turkish prohibition of the export of Angora goats, and how to overcome the same 653
Heidenheim:
Cattle-breeding at 453
Hellbronner cattle:
Exportation 453
In Thuringia 439
Heldenfingen dairy association 460
Herd-books:
Ayrshire 66
Guernsey 126
Hereford, when founded 183
In Germany 397
Marsh cattle 415
Polled Angus 166, 193
Red Polled 66, 81
Shorthorn 66
Welsh 65, 81, 153
Herders and rangers in Honduras 599
Herding and managing cattle in Argentine Republic 607
Herding cattle on estancias in Argentine Republic 611
Herds, celebrated:
Abbey Farms, Shorthorn 72
Chadnor Court and Leen, Hereford 177
Colman, Red Poll 90
Colonel Gunther's, Shorthorn 204
Didlington, Red Poll 89
Duke of Devonshire, Shorthorn 60
Duffryn, Shorthorn 69
Earl of Ducie's, Shorthorn 204
Einsiedeln Monastery, Swiss 300
Fuller's, Ontario, Jersey 559
Guernsey 125–127
Highland, Lord Kinnaird's, Benmore, Bredalbane, and Duke of Athol's 144, 145
Hutchinson, Shorthorn 105
Kerry 130–132
Lofft-Suffolk, Red Poll 71
Lord Braybrooke's Jersey 121, 122
Napoleon III, Shorthorn 204
Necton Hall, Red Poll 90
Page, Swiss 299
Red Poll 71, 88, 90, 91, 92
Sandringham 68, 710
Shorthorn 101, 102, 105
Swanington, Red Poll 91
Whittington, Red Poll 91
Windsor, Herefords (the Queen's) 161
Herds, increase, annual, in Honduras 600
Hereford cattle:
Bull, Thoughtful 739
Chadnor Court and Leen herds 177
Characteristics of 88, 110, 161, 174, 190
Cow, Leonora 739
Do not degenerate in foreign countries 176
Exported to the United States, number of 178
Fair, Hereford City 182
For crossing, valuable qualities 112
For dairying 186
How to export 178

Hereford cattle—Continued. Page.
In Canada 539, 543, 556, 558
Cape Colony 670
Colombia 633
Foreign countries 187
Herd, an impressive sight 172
Ireland 161
New Zealand 645
United States 161
Milk and butter yield 75, 161, 162, 171, 187, 191
Milking qualities of 114
Origin and history of 58, 111, 173, 182
Present habitat 175
Prices of 75, 76, 80, 162, 177, 178, 184, 185
Valuable qualities of 111
Weight 59, 72, 74, 114, 161, 162, 171, 173, 180, 184, 190, 191
Herefordshire:
Description of 173, 181
Great cattle fair in 182
Topography, soil, climate, &c 162, 173, 181
Herring, D. W., consul at Tegucigalpa:
Report: Cattle in Honduras 597–602
(Pasture lands, 597; cattle breeding and destruction of cattle by wild beasts, 598; the cattle spider, stock rangers and herders, cattle taxation and export duties, cattle increase, 599; exports of cattle, 600; cattle census, maturity of cattle, butchering and cooking; outlook for cattle raising in Honduras, 602.)
Hesse-Darmstadt:
Area, soil, cultivation, topography, &c 483, 484
Cattle in 485
statistics of 480
Climate 484
Milk yield of cows in 487
Population and products 487
Hesse-Nassau 389, 390
(Temperature, area, population, cattle census, &c.)
Hides, export of:
From Lower California 596
Sierra Leone 677
Yang-tse-Kiang Valley 661
Highland cattle:
Characteristics of 63, 143, 196, 212, 218
Meat producers and park animals 143
Milk, butter, and cheese yield 75, 197, 216, 219
Noted herds of 144–147
Prices 76, 80, 96, 214, 222
Soil, climate, housing, &c., Western Highlands 146, 216
Weight 74, 107, 145, 146, 180, 216, 217
History of cattle. (*See* Origin.)
Hogs:
British breeds and characteristics:
(Berkshires, 760, 789; Dorset, 761; Suffolk, 761, 789; Yorkshire, 760, 761, 789; Improved Essex, 761; Tamworth, 762; Irish, 762.)
In Nuevo Leon, Mexico 590
Saxony 431
Hohenheim Agricultural School, and cattle breeding at 448
Holland:
Breeds in—
Drenthish 504, 515
Dutch-English 504, 515
Flemish 504, 515
Flemish-Gelderian-Holland 504, 515
Friesland 503, 515
Friesland-Drenthish-Geldrian 504, 515
Geldrian 504, 515
Groninger 503, 515
Groninger-Friesland-Geldrian 504, 515
Holland (Dutch) 503, 515

Holland—Continued.	Page.
Census of cattle in	10, 232, 400, 508, 517
Cross-breeds in	504
Decrease of stock in	509
Dutch cattle for the United States, best	505
Imports and exports of live stock	516
Imports of American cattle products into	510
Milk yield of Dutch cows	511
Misnaming Dutch cattle in the United States	504
Percentage of different breeds of cattle in	515
Prices of Dutch cattle	505, 516
Routes and cost of transportation to the United States	506, 516
Special statistics of Dutch cattle	511, 512
Stock recuperation in Holland	500
Holland cattle. (*See also* Dutch cattle.)	
Characteristics	367, 392, 404, 411, 508, 515
Introduction of, into Germany	411
Milk yield	393, 404, 411, 436, 511
Products of milk, butter, and cheese	437
Weight	393, 437
Holstein cattle. (*See also* page 504.)	
In Canada	538, 552, 556
Silesia	436
Meat yield	393
Milk yield	411, 558
Weight	411, 558
Holt, George H., consul at Gaspé Basin:	
Report: Cattle in the Gaspé Basin district	574
Honduras:	
Butchering and cooking in	602
Cattle breeding in	598
Cattle spider, destruction of cattle by	590
Census of cattle in	602
Destruction of cattle by wild beasts	598
Exports of cattle	600
Herders and rangers in	599
Increase of cattle in	590
Maturity of cattle in	602
Outlook for cattle-raising in	602
Pasture lands of	597
Horses:	
American, for Belgium	383
In Nuevo Leon (breeding)	501
Saxony, census	431
Housing cattle in (*see also* Special statistics):	
Agricultural school at Hohenheim	450
Andalusia	387
Ayrshire	136, 168
Baar	409
Baden	475
Bavaria	477
Brazil	632
Cornwall	207
Denmark	492
France	246, 277, 283
Galicia	388
Harz Mountains	483
Holland	514
Hungary	531
Jersey	207
Normandy	283
Oldenburg	421
Ontario	544, 545, 558, 564, 566, 568, 570
Padua	351
Prince Edward Island	575
Quebec	574

Page.

Housing cattle in—Continued.
- Rhine Province 488
- Russia 524
- Schleswig-Holstein 431
- Scotland 216, 220
- Sierra Leone 671
- Silesia 433
- Switzerland 293, 308, 323
- Syria 652
- Terra di Lavoro 329
- Thuringia 440
- Tuscany 329
- United Kingdom 172
- Yang-tse-Kiang Valley 664

Howard, Walter E., consul at Toronto:
- Report: Cattle of Ontario 547–556
  (How Ontario became possessed of blooded cattle; the Canadian Shorthorns, 547; Canadian Ayrshires and Herefords, 548; Canadian Devons, 550; Canadian Polled Angus and Jerseys, 551; Canadian Holsteins; general remarks, 552; special statistics, breeds, yield, weight, price, &c., 553; topography, soil, substratum, grasses, 554; care and handling Shorthorn fat stock, 555; census of grade and native cattle, 556.)

Hungary:
- Breeding cattle in 531
- Buffalo cattle of 530
- Butter and cheese making in 531
- Cattle raising in 527
- Census, cattle, of 10, 400, 522
- Cost and routes of transportation to the United States 584
- Cross-breeds for dairying in 527
- Exports of cattle and meat from 533
- Healthiness of cattle 533
- Housing and feeding cattle in 531
- Imports of canned beef from the United States 533
- Imports of cattle into 532
- Meat and work cattle of 527
- Outlook for cattle raising in 534
- Prices of Hungarian cattle 534
- Special cattle statistics 535, 536
- State encouragement of cattle breeding 528
- White cattle of 528

Iceland, Polled cattle in 146

Illustrations. (*See* List of Illustrations immediately following Contents.)

Imported cattle, results of breeding from 441

Imports:
- American canned beef into Hungary 533
- Animals and their products into France, for food 262

Imports, cattle:
- American, into:
  - Germany 403
  - Bordeaux 279
  - Havre 284
  - Mexico 577, 581
  - United Kingdom 5–7, 26
  - Belgium 369
  - France 262, 271
  - Holland 516
  - Hungary 532
  - Mauritius 673
  - Saint Thomas 640
  - Scotland 215
  - Switzerland 287, 321
  - United Kingdom 5, 26, 79, 80
  - United States, first blooded 51

	Page.
Imports, beef:	
Into Mauritius	673
Rio de Janeiro	630
United Kingdom (fresh)	7, 29
(other)	12
Imports, butter and cheese:	
Into Belgium	368
Saint Thomas	640
Switzerland	315
United Kingdom	15, 20, 82, 86
Imports, dairy products, into Cape Colony	670
Imports, live stock, into Holland	510
Imports, meat:	
Into Belgium	369
France	262
Scotland	215
Saint Thomas	640
Imports, meat, preserved, into the United Kingdom	12
Products, American, into Mexico	581
Improvement of:	
Argentine cattle	616
Breeds by transference to foreign countries	505
English dairy cattle	717
German cattle	396
Increase in cattle in Honduras	599
Increase in weight, daily, of various breeds of cattle	47, 723
Insurance companies, cattle, in Germany	492
Introduction of:	
Cattle into the River Plate	604
Blooded cattle into:	
New Zealand	646, 647
Ontario	547
United States	51
Dutch cattle into Germany	411
Ireland:	
Breeds of cattle in:	
Devon	158
Dexter	227, 228
Longhorn (old Irish cow)	94
Kerry	65, 129, 227, 228
Limerick Dairy	227, 228
Shorthorn	60, 226, 227, 228
Butter:	
Industry of	229–239
In hermetically sealed packages	229–231
Trade of	231–235
Cattle trade of	225
census of	10, 80, 225, 227, 232, 400
Foot and mouth disease in	224
General information concerning cattle in	226
Grasses, soil, temperature, &c	228
Land, utilization of	228, 232
Prices of butter in Cork, 1841–1881	234
Isigny (Normandy) butter, celebrated	244
Isle of Wight:	
Guernsey cattle in	126
Jersey cattle in	123
Italy:	
Breeds of cattle in—	
Bellunese	340, 353
Brittany	326
Buffalo	327, 328
Chianina	326, 346, 352
Freiburg-Friulano	326
Holland; Mantuan	326
Maremmano	332
Mountain	329

Italy—Continued. Page.
Breeds of cattle in—
Parmense ... 326
Piamora ... 329
Piedmontese ... 325, 329
Podolian ... 338, 354
Pugliese ... 326, 346, 352
Swiss ... 326, 332, 344, 347, 340
Udine ... 337
Butter making in ... 344, 681
Characteristics of cattle ... 328, 329, 333, 355
Cheese making in ... 677–681
Climate, effects of, on imported cattle ... 353
Housing, feeding, and caring of cattle ... 329, 333
Milk, butter, and cheese yield of cattle ... 328, 329, 334, 355
Prices of cattle in ... 331, 334, 355
Special statistics of Italian cattle ... 328, 333, 355–358
Suitability of cattle for the United States ... 334, 354
Transportation of cattle to the United States, routes, cost ... 328, 332, 335
Weight of cattle ... 328, 329, 331, 333, 334, 355
James, Henry M., commercial agent at Simcoe, Ontario:
Report: Cattle in the Simcoe district ... 570
(Cattle, uses, prices, breeding, yield, weight, breeds, topography, housing, handling, &c.)
James, James, a Guernsey farmer, on Guernsey cattle ... 128
James, Mr., of Blandford, Dorset, on Hereford cattle ... 176
Japan:
Cattle and cattle products in; price of beef in Nagasaki; sheep will not live on grasses in. 663
Java:
Buffalo cattle, habits, uses, &c ... 661
Cattle plague in ... 662
Jersey cattle:
Calves: feeding, fattening, and treatment ... 119
Census of ... 166
Characteristics ... 64, 116, 167, 200, 205, 206
Cream yield from milk ... 123
Dairy record of Lord Braybrook's herd ... 121
Decrease of stock ... 168
Export of (fancy) from Ontario to the United States ... 557, 558
Food of (cows, 122) ... 119, 122
In Cape Colony ... 670
Ontario ... 538, 540, 543, 551, 556, 557, 558, 561
Milk and butter yield ... 75, 118, 120–123, 167, 171, 187, 191, 201, 559, 561, 566
Origin and history of ... 117, 205
Points of, true type, cow and bull ... 116
Prices, fancy ... 76, 168, 201
general ... 168, 201, 557, 559
Richness of milk ... 122
Statistics of, in the Isle of Wight ... 123, 124
Ontario *vs.* native cattle ... 572
Weight ... 74, 167, 201, 206
Jersey, island of:
Cattle breeding and dairying in ... 118–121
Census of cattle in ... 166
Characteristics of cattle in ... 64, 116, 167, 205, 206
Food requirements of cattle ... 206
Housing, feeding, and handling products in ... 207
Milk yield of cattle in ... 200, 206
Origin and improvement of breed ... 117
Topography, soil, &c ... 206
Jeveland:
Description of district ... 410
Housing, feeding, breeding, and handling products ... 420
Soil and climate ... 417
Special cattle statistics of ... 420
Jockey Club, American, first of its kind ... 41

Page.
Jones, Alexander C., consul at Nagasaki—
Report: Cattle in Japan 663
(Beef, milk, butter, and cheese unknown in Japan previous to the arrival of foreigners; cattle and their products; price of beef in Nagasaki, &c.)
Jutland cattle, characteristics, milk yield, &c 491, 492
Kains-Jackson, H., on French cattle 729–734
Kent, cattle in the weald of 711
Kerry cattle:
Characteristics 65, 129, 228
Crosses 133
Experience of breeders and farmers 129–133
Meat and milk yield *vs.* Ayrshire and Galloway 133
Milk yield 129–133, 227
Origin 65, 228
Price 80
Weight 133, 227
Kingscote, Col. Nigel, M. P., on Cotswold cattle 74
Kirchberg, cattle-breeding at 452
Kirchheim-under-Teck, bull-keeping at 450
Knight, A. J., on Kerry cattle 130
Landais cattle and district:
Characteristics, grazing lands, prices, weight 277
Habitat, uses, bull races, meat cattle 256
Soil and climate of Landaise 278
Land, division of, in France 266
Lands and stock of Uruguay, value of 622
Lane, William J.: Evidence before committee of House of Commons on the butter industry of Ireland 235–239
Lapoint, Alfred, vice-consul at Chiclayo:
Report: Cattle in Peru 636
Lathrop, Lorin Andrews, consul at Bristol:
Report: Hereford cattle 172–180
(Hereford cattle in the herd, 172: origin and history; climate of Herefordshire, 173; the ideal Hereford, &c., 174; miscellaneous information, 175–178; how to export Herefords to the United States, 178; Herefords in the United States, 179; weights of British cattle exhibited at Smithfield in 1883, 180.)
La Villette (Paris abattoir), statistics of 258
Laws:
Association dairy, of Wurtemberg 691–694
Cattle, of Wurtemberg 743–752
Cattle, quarantine 643
Leonard, J. A., consul at Leith:
Report on Scotch breeding-cattle for the United States 217–224
(Editorial from North British Agriculturist, 217; special statistics concerning Scotch breeds, 218: characteristics of a typical Galloway, 219; characteristic points of Ayrshires, 220; methods of housing, 220; feeding, breeding, handling products, and topography of Scotland, 221; export and prices of cattle; distribution of cattle in Scotland, 222; breeding for dairy and butcher; census of cattle in Scotland; imports of cattle into Great Britain; portraits of representative Scotch cattle, 223.)
Lewis, Griffith, on Welsh cattle 155
Lewis, Judson H., consul at Sierra Leone:
Report: Cattle in Sierra Leone 671
(Housing, feeding, and prices of; export of hides to the United States.)
Liebeg's extract of beef factory in Uruguay 624
Limbourg cattle:
Characteristics 391, 417
Milk-yield and weight 392, 417
Prices of 396
Limerick dairy cattle, characteristics of 227, 228
Limousine cattle:
Characteristics of 248, 278, 726
Cross-breeds 249
Grazing lands of 278
Meat yield of 248
Milking qualities of 727
Price and weight of 278

Page.
Live stock and population: Belgium, France, Germany, Holland, United Kingdom 232
Live stock in:
Bavaria, census of 709
France, Paris Exhibition, 1883 729–734
Russia, census and distribution of 821, 822
Live Stock Journal (British) on sheep and mutton in 1883 782–786
Lofft, Mr., Suffolk:
On Lofft-Suffolk Red Polls 71
Experimental breeding of Red Polls 92
Lombardy, Swiss cattle in 324
London Dairy Show:
Milking trials at 720
Tests, milk analyses, &c 202
London Farmers' Hand-Book on French live stock 724–729
Longhorn cattle:
Characteristics 60, 95, 96, 199
Milk, butter, and cheese yield 75, 97, 199
Origin and history of 94–96, 199
Prices of 80, 190, 199, 205
Productiveness of, compared with Shorthorns 97
Weight 74, 94, 97, 197
Long, James, Hetchin, England:
First report: On cattle breeds in the United Kingdom 79–156
Second report: Scientific dairy instruments 685–686
Third report: Cream-separating machines 688–691
Fourth report: Seven years record of the receipts in a Wiltshire dairy of crossbreds 691
Fifth report: Transport of cattle from Liverpool to the United States 694–696
Sixth report: Feeding cattle on the soiling system 701–703
Seventh report: Mixed food for cattle 703, 704
Lord Airlie, Scotland, on milky qualities of Polled Angus 543
Losses, cattle:
From spider in Honduras 599
disease in Ireland, foot-and-mouth 224
Mexico 583
Plains of Bogota 633
From driving in Mexico 581
droughts in Mexico 577, 582
snow and rain storms in Argentine Republic 609
wild beasts in Honduras 598
Lourdes cattle, characteristics and milking qualities 726
Lower California 596
(Old Spanish cattle of; imports of American cattle; exports of beef, tallow, and hides.)
McAdam, Dr., Edinburgh, on feeding stuffs 46
Machinery, dairy 371, 685–691
Mackinder, John W., on Long-wool Lincolns 763
Malaysia, Water Buffalo of; habits, characteristics, uses, &c 660
Malta, cattle in 323
Mancelle, cattle 249
(Characteristics; Mancelle-Durham, &c.)
Maracaibo, cattle and cattle products in 636
Maremmana cattle, characteristics of 232
Market, Neuss cattle 488
Markets, British cattle 606–609
Marking (branding) cattle in Argentine Republic 612
Ceylon 657
Mexico 578
Mark Lane Express on weights of sheep at Islington 778–782
Marne, cattle product of the district of the 285
Marshes, Germany:
Cattle-breeding in 415
Export of Marsh cattle 418
Housing, feeding, &c., in the 421
Products of Marsh cattle 418

Pages.

Mason, Frank H., consul at Basle:
Report on Swiss cattle 287-297
(The two principal races and their subsidiary breeds; Swiss imports and exports of cattle, 287; prices and exports of choice cattle, 288; Bernese (Simmenthal) cattle, 289-291; Black-spotted Freiburg cattle; Bernese-Durham, 291; Brown Schwitzer cattle, 291, 292; Bernese and Brown Schwitzer cattle compared; herding, housing, and feeding Swiss cattle, 293; Swiss system of slaughtering; meat product of various cattle, 295; feeding calves; transportation to the United States, 296; special statistics of Swiss cattle, 297.)
Mason, Joseph T., consul at Dresden:
Report: Cattle in Saxony 426-431
(Cattle in Saxony, 426; agriculture and cattle statistics, 427; stock of cattle in, 428; census of live animals in, 429-431.)
Mathews, Felix A., consul at Tangier:
Report: Cattle in Morocco 672
(Origin of cattle; milk, butter, and cheese yield; size, weight, and characteristics; meat yield; soil, substratum, feeding, &c.)
Mauritius, imports of beef and beef cattle into 673
McCombie: Feeding Polled Angus cattle 62, 63
McDonald, editor of North British Agriculturist:
On Hereford cattle 175
On Scotch cattle most suitable for the United States 217
Meat, American:
Exports of 4, 21, 22, 37
In Holland 510
United Kingdom 7, 8, 9, 29
Meat cattle:
British:
Ayrshire 136
Devon 58, 80, 108, 160, 201, 206
Galloway 80, 147, 149, 151, 152, 195, 214, 218
Hereford 80, 111, 177, 188, 190, 201
Highland 144, 145, 196, 213, 214, 218
Longhorn 80, 190
Polled Angus 80, 139, 141, 193, 201, 214, 218
Red Polled 93, 196
Shorthorn 80, 100, 157, 190
Sussex 80, 115, 160
Welsh 198
French 244, 247, 249, 251, 255, 256, 274, 275, 284, 728, 729-734
German 391, 392, 393, 404, 447, 472, 474, 479
Hungarian 527, 529
Italian 333, 356
Spanish 336
Swiss 290
Meat, exports from:
France 262
Hungary 538
United States 4, 21, 22, 28, 37
Uruguay 623
Meat, frozen, trade of the Plate 625
Meat grading at Lille, London, and Paris 260, 261
Meat imports into—
Belgium 309
France 262
Germany, from the Argentine Republic 13
United Kingdom 7-9, 11, 12, 14, 29
Meat, preserved fresh, Belgian process 370, 699-701
Meat, price of:
In France 262
Japan 663
Stuttgart 456
United Kingdom 7, 8, 9, 12
Meat, supply of Wurtemberg 455

Page.
Meat yield:
By measurement of cattle 85
Of Austrian cattle 296
British cattle:
Ayrshire 219
Devon 160
Galloway 211, 219
Hereford 162
Highland 216, 219
Jersey 167
Polled Angus 165, 216, 219
Red Polled 163
Shorthorn 158
French cattle 274, 296, 730
German cattle 467, 489
Hungarian cattle 535
Italian cattle 296
Mexican cattle 587
Russian cattle 520
Swiss cattle 296
Uruguayan cattle 621
Merritt, E. A., consul-general at London:
Report: Cattle of the United Kingdom 57–78
(The Devons, 57; the Herefords, 58; the Shorthorns, 59; the Longhorns, 60; the Red Polls and Sussex, 61; the Polled Angus and Galloways, 62; the Highlanders and Ayrshires, 63; Jerseys and Guernseys, 64; Welsh and Kerry cattle, 65; selection of foreign cattle for the United States, 65; publications concerning British cattle, 66; prize *vs.* ordinary stock; geological formation of the British Isles, 67; the Sandringham herd, 68; the Duffryn herd of Shorthorns, 69; responses from various quarters, 70–72; the Abbey Farms herd of Shorthorns, 72; Denchfield stock, 73; Cotswold cattle, weights of various breeds, 74; milk and butter yield and prices of various breeds, 75; transport to the United States; cattle census of the United Kingdom; exports of British cattle; acknowledgments, 77. *Inclosures:* The Sandringham herd, 710; cattle in the Weald of Kent, 711; cattle and sheep in Bucks, 711; prize breeders of British cattle, 712–715; milk record of 60 British cows, 715; position of English dairy farming in 1883, 716–720; milking trials at the London dairy show, 720–722; central chamber of commerce, 722; daily increase in weight of various British breeds, 723; French live stock, 724–729; French fat and live stock, 729–734; British prize cattle, 735–742; breeds of sheep in the United Kingdom, 755–760; breeds of pigs in the United Kingdom, 760–762; Cotswold sheep, 762; long-wool Lincolns, 763; Southdown sheep: history, breeding, and management, 763–772; Southdown sheep and Cambridgeshire farming, 773–777; French sheep, 777; weights of sheep at Islington, 778–782; sheep and mutton in 1883, 782–788; sheep portraits, 788; Berkshire and Yorkshire pigs, 789; black Suffolk pigs, 790.)
Meeskirch cattle:
Breeding and feeding 466
Characteristics of 465, 472, 473, 474
Milk and meat products 467
Origin 465
Prize winners, prices of 468
Weight, size, &c 466, 472, 474
Meskirch, district of, climate, soil, &c 464
Mexico 576–596
Lower California:
Cattle and cattle-breeding 596
Exports of cattle products 596
Northern Mexico:
Breeding methods in 578–580
(Bulls, oxen, cows, branding, 578; wild cattle, castrating, quality of beef, price of beef, 579; age of cattle at maturity, 580.)
Cattle and products 576, 577
(Origin of breed, uses, milk, butter, cheese, 576; variations of breed, colors, grasses, and other food, water, tanks, 577.)
Census 582
Climate 594

Mexico—Continued. Page.
Northern Mexico—Continued.
Diseases ... 583
Duties ... 580, 582
Elevations of principal points ... 581
Exports of cattle to the United States ... 581
Imports of cattle products from the United States ... 581
Mexican cattle for the United States, value of ... 580, 581
(Breeding cows, beef cattle, American duties, prices of cattle, export duties, markets, 580; driving and cost of, 581.)
Soil ... 584
Weights and measures of cattle ... 583
State of Chihuahua ... 585, 587
(Cattle rearing, laws regulating, 585; soil and climate, driving cattle to United States, milk and cheese, cattle gathering (*rodeos*), benefits of crossing, 586.)
State of Nuevo Leon:
Breeds, native preferred to foreign ... 588
Cattle ... 587, 588
(Breed, meat, 587; work-oxen, 588.)
Burro (ass), usefulness of ... 591
Census, cattle ... 589
Dairyman wanted in ... 589
Exports of cattle to the United States ... 588
Goat-raising ... 590
Hog-raising ... 590
Horse-raising ... 591
Milk, butter, and cheese in ... 588
Mule-raising ... 591
Topography ... 587
State of Sonora ... 595
(Breed; prices; exports to the United States; imports of cattle products from the United States; Sonora as a cattle range.)
State of Tamaulipas ... 592–594
Cattle exports ... 593
Cattle range ... 592
Droughts, effects of ... 592
Grasses ... 593
Milk, butter, cheese ... 593
Miscellaneous statistics ... 593
Mezenc cattle, habitat and characteristics ... 727
Miesbacher cattle ... 383, 396
Milch cows, number of, in United Kingdom (*see also* Cows) ... 232
Milk:
Condensed:
Export of Swiss ... 312
Manufacture in the United States ... 313
Industry of Switzerland ... 312
Cure establishments in Switzerland ... 312
In Argentine Republic ... 603
Mexico ... 576, 588, 593
Silesia ... 433
Syria ... 653
No Japanese or Chinese word for ... 663
Purity of St. Gall ... 312
Record of Dutch cows ... 511
Record of Guernsey cows ... 126
Record of Shorthorns ... 103
Record of Swiss cows ... 319
Record of Wiltshire dairy ... 691
Tests, at Agricultural School, Ontario ... 561
Tests, London dairy ... 202, 720
Tests, milk and cream, in England ... 89
Trials in:
England, various breeds ... 104
Holstein, Model Farm ... 412
Saxony; Frisian, Schleswig, and Silesian cows; five years' trial ... 412

Page.

Milking qualities:
Belgian cows ... 374
British cows:
Devon ... 192
Guernsey ... 126
Hereford ... 113, 114
Highland ... 197
Jersey ... 200
Longhorn ... 95–97, 199
Polled Angus ... 165, 218, 543
Shorthorn ... 70
French cows:
Flemish ... 342
Norman ... 244, 263
Russian cows ... 524
Swiss cows:
Schwitzer ... 292
Simmenthal ... 289
Milk yield (*see also* Special statistics):
And value, dairy farming in England ... 718
Of American cows ... 299
Belgian cows ... 363, 378–381
Bermudan cows ... 639
Brazilian cows ... 631, 632
British cows:
Ayrshire ... 75, 137, 168, 171, 200, 202, 212, 216, 217, 219, 525, 648
Devon ... 75, 159, 160, 164, 171, 192, 202
Galloway ... 75, 148, 216, 219
Guernsey ... 125–127, 202
Hereford ... 75, 161, 162, 171, 187, 191
Highland ... 75, 197, 216, 219
Irish cows ... 236
Jersey ... 75, 118, 120–123, 161, 162, 167, 171, 187, 191, 201, 202, 205
Kerry ... 130–134, 227, 228
Limerick dairy ... 227
Longhorn ... 75, 97, 199
Polled Angus ... 75, 171, 194, 216, 219
Red Polled ... 88–90, 163, 171
Shorthorn ... 75, 103, 107, 157, 190, 202, 216, 227, 228
Sussex ... 75, 114, 160, 196
Various breeds:
Sixty cows for a year ... 375
Munster dairy school ... 48
Wiltshire dairy ... 691
Welsh ... 75, 154, 155, 166, 171, 198
Danish cows, Angeln ... 490–495
Dutch and Flemish ... 378
Ecuadorian cows ... 635
French cows ... 242, 246–248, 252, 258, 265, 276, 286
German cows ... 391–394, 404–406, 410–412, 424, 435–437, 439, 442, 445–447, 464, 467, 469, 472, 474, 478, 483, 487, 489
Holland cows ... 511, 512
Hungarian cows ... 535
Italian cows ... 328, 329, 333, 342, 344, 358
Mexican cows ... 586
Moorish cows ... 672
Munster dairy school ... 48
New Zealand ... 648, 650
Ontario cows ... 553, 558, 559, 561, 563, 566, 567, 569, 570
Ontario cows, various, Model Farm ... 561
Prince Edward Island cows ... 575
Quebec cows ... 573
Russian cows ... 520, 524, 525
San Domingo cows ... 644
Singhalese cows ... 656

Milk yield—Continued. Page.
Seychelles cows 674
South African (Cape Colony) cows 670
Swiss cows 297–301, 306, 319, 322
Syrian cows 654
Yang-tse-Kiang Valley cows 666
Model Farms:
Ontario, relative yields of cattle at 561
report on value of feeding stuffs 561
Wood Farm, Hull, treatment of Shorthorns at 105
Montafoner cattle:
Characteristics; milk-yield; weight 393, 405, 446
Habitat 393, 446
Price 396
Moray, Drummond, Stirling, on Highland cattle 145
Morey, W., consul at Colombo:
Report: Cattle of Ceylon 655–660
(Difficulties attending cattle-breeding in Ceylon, 655; Singhalese cattle, 656; imported Buffalo cattle in Ceylon, 657; cattle, summary, 658.)
Morland, W. C., on Morland Sussex cattle 72, 711
Morocco, cattle statistics, topography, climate, &c 672
Mosher, George F., consul at Sonneberg:
Report: Cattle in Thuringia 438–442
(Description of Thuringia and Thuringian cattle, 438; sizing cattle, and cows as draught cattle in Thuringia, 439; housing, feeding, breeding, and handling products in Silecia, 440; Thurnigan butter and cheese; results of breeding im-imported stock; distributive statistics, 441; special cattle statistics, 442.)
Mountain cattle 307, 329, 728
Mule-raising in Mexico 591
Munster, Ireland:
Acreage and crops 228
Cattle statistics, census, breeds, &c 227
Dairy School, feeding cows at 48
Topography, grasses, soil, temperature 228
Murray, Gilbert, on the position of English dairy farming in 1883 716–720
Mürzthaler cattle, characteristics, price, &c 396
Mussey, Evelyn F., consul at Mahé:
Report: Cattle in the Seychelles Islands 674, 675
(The African hump-backed cattle; importation of meat cattle; topography; breed, milk yield, weight, feeding.)
Neckar cattle:
Characteristics 447, 473
Habitat 471
Milk-yield 391, 448
Prices 396, 471
Weight 391, 448, 471
Neuss cattle market 488
Norfolk cattle. (*See* Red Polled cattle.)
Norfolk: Topography, soil, temperature, &c 164
Normandy:
Beef cattle of 284
Butter (celebrated "Isigny") 283
Feeding and housing cattle in 283
Price of beef and beef cattle in 284
Situation, soil, climate, &c 282
Normandy cattle:
Beef cattle of 284
Characteristics 243, 282, 724
Durham-Switz-Normand 245
Feeding and housing 283
High quality of meat 245
Milking qualities of 244, 283
ss. Jerseys and Alderneys 283
Weight of meat cattle 244

Noyes, McWalter B., consul at Venice: Page
Report: Cattle in Venetia 335–357
(Geological formation of Venetia, 335; Province of Udine and pasture lands in, 336; herding and dairying in Udine, and cattle of, 337; improving Udine cattle, 338; cattle in Treviso, 338; cattle in the province of Belluno, 339; dairying in Belluno, 341; province of Vicenza, and mountain herding and dairying in, 343; butter and cheese making in Vicenza, 344; dairying in the lowlands of Vicenza, 345; from mountain to lowland stock-raising, 346; cattle in the province of Padua, 347; fattening cattle in Padua, 348; food analyses, 350; housing and dairying in Padua, 351; cattle in the province of Rovigo, 351; cattle in the district of Venice; effect of the Italian climate and herbage on imported cattle, 353; the ox of the country (Podolian); suitability of Italian cattle for the United States, 354; prices of Italian cattle; transportation to the United States, 355; size, weight, and product of cattle in Venetia, 355; breeds of cattle in Venetia, and their product; climate and topography of Venetia, 356; substratum and cultivated grasses, 358.)
Nuevo Leon. (*See* under Mexico.)
Octroi taxes in France 260
Odenwald cattle, characteristics, size, milk, price 471, 485
Oldenburg:
American cattle and hogs in 423
Best cattle for export to the United States 423
Cattle and cattle breeding in the Marshes 415
Cattle of, breeds, weight, height, milk, feeding, &c 409, 410
Export of cattle to the United States, routes and cost 419
Housing, breeding, feeding, &c 421, 425
Imports of meats and dairy products into 423
Percentage of the different breeds in 423
Product and export of Marsh cattle 418
Soil and climate of 413
Special cattle statistics—yield, size, weight, breeds, &c 424
Superiority of Oldenburg cattle for export 418
Tillage and grazing lands of 414
Value of cattle of the duchy 415
Oldenburg cattle:
Characteristics 409, 415, 418, 426
Milk yield 409
Weight of cattle 409
Oleomargarine:
American, in Holland 510
Dutch butter: sale in Ireland and in England as Irish and English butter 15, 239
Exports from the United States 19
Ontario Agricultural Commission:
Conclusions of, regarding the several breeds of cattle 538, 539
On Polled Angus cattle 541, 542
(*See* Dominion of Canada.)
Oppenheim, Ernest J., consul at Cadiz:
Report: Cattle in Andalusia 384–387
(Andalusia and its cattle, 384; topography of the province of Cadiz; pasturage of Western Andalusia, 385; area of pasture lands of province of Cadiz; statistics of cattle of Western Andalusia, 386; products, housing, feeding, breeding, and census of domestic animals, 387.)
Origin and history of cattle:
British:
Ayrshire 63, 134, 199, 212
Devon 57, 107, 158
Galloway 149, 210, 216
Guernsey 124, 128
Hereford 58, 111, 173, 182
Highland 216, 219
Jersey 117
Kerry 229
Longhorn 61, 94
Polled Angus 86, 139, 193, 216, 219
Red Polled 61, 71, 86, 162
Shorthorn (assumed) 366
(real) 59, 98, 216
Welsh 153, 309

Origin and history of cattle—Continued. Page.
Brazilian 630
Danish 492
Ecuadorian 635
European 390
French 244, 245, 255, 265, 272
German 391, 392, 393, 394, 442, 443, 465, 480
Mexican 576
Moorish 672
River Plate 604
Singhalese 656
Swiss 287, 297
Syrian 652
Venezuelan 637
Outlook for cattle raising:
In Argentine Republic 620
Honduras 602
Hungary 534
Pace, Samuel D., consul at Port Sarnia:
Report: Cattle and dairy farming in Ontario 540–546
(Native cattle bred out; Canadian Polled Angus, 540; census of blooded cattle in Ontario, 542; milking qualities of the Polled Angus; transportation to the United States, 543; feeding and housing cattle, and cheese-making in Ontario, 544; treatment of dairy cattle in and climate of Ontario, 545; value of weather reports to farmers, 546.)
Packard, Stephen B., consul at Liverpool:
Report: Select breeds of British cattle 156, 172
(Shorthorns, 157; Devons, 158, 164; Sussex, 160; Herefords, 161; Red Polls, 162; Polled Angus, 164; Welsh, 166; Jerseys, 166; Ayrshires, 168; exportation of British cattle to the United States, 169; where to purchase British cattle, 170. Special statistics: Breeds, yield, habits, weight, characteristics, and product; climate and soil, 171; substratum, grasses, housing, handling, and breeding, 172.)
Padua:
Cattle in, descriptions, census, &c. 347, 348
Climate of 356
Dairying in 351
Food analyses; cattle 350
Grasses of 358
How cattle are fattened in 348–350
Soil and subsoil of 358
Page, Mr., on Sussex cattle 115
Parker, Benjamin S., consul at Sherbrooke:
First report: Operations of Canadian cattle companies in the United States 537, 538
Second report: Cattle raising in Quebec 571–574
(Introductory, native cattle, best dairy cattle, cattle fodder, 571; the most suitable breeds for Quebec, Jerseys vs. native cattle, 572; disposition of cattle and cattle products. Special statistics of cattle: Yield, weight, characteristics, origin, &c., 573; topography, grasses, housing, feeding, &c., 574.)
Perry, Mr., of Ledown, North Devon, on Devon cattle 109
Piatt, John J., consul at Cork:
First report: Cattle in Ireland 224–229
(Ravages of the foot and mouth disease, 224; cattle trade and cattle census of Ireland, 225; general information concerning cattle in Ireland, 226; special statistics of cattle of Ireland, 227; topography, climate, acreage, &c., 228.)
Second report: Butter industry of Ireland 229–239
Plumacher, E. H., consul at Maracaibo:
Report: Cattle and meat supply of Maracaibo 638
Polled Angus cattle:
Breeding and rearing in Scotland 208–210
Characteristics 87, 139–142, 165, 193, 219
Experience of breeders of 139–142
Habitat 164
Housing 165
In New Zealand 647
Ontario 538, 540, 542, 551, 556, 558, 561
Milking qualities 165, 218, 542

	Page.
Polled Angus cattle—Continued.	
Milk-yield	75, 88–92, 171, 194, 216, 219
Number registered in herd-book	193
Origin and history of	86, 139, 193, 216, 219
Prices of	76, 80, 166, 193, 194, 201, 205, 209, 210, 214, 222, 538, 551
Weight	61, 74, 92, 165, 166, 180, 194, 218
Polled cattle in Iceland and Norway	140
Population and live stock:	
In Belgium	23
France	232
Germany	232
Great Britain	232
Holland	232
Ireland	232
Russia	521
Thuringia	441
Venezuela	657
Wurtemberg	444
Portraits of cattle. (*See* List of illustrations following Contents.)	
Pregnant cattle, food of	45
Prentis, Thomas F., consul at Port Louis:	
Report: Cattle in Mauritius	673
Prescott, Ontario, district of:	
Breeds and breeding in, character of	564
Distillery-fed cattle for export from	565
Prices of cattle in	565
Special cattle statistics of	566
Topography, soil, housing, feeding, &c	566
Preservation of meats and vegetables fresh, Belgian method	370, 699
Prices, beef, fresh, imported:	
In England	7, 8
Normandy	284
Rio de Janeiro	682
Preserved other than by salting:	
In England	12
Prices, butter:	
Imported into the United Kingdom	15–17
In Cork, 1841–1881	17, 234
Prices of cattle:	
Argentine	618
Belgian	363–365
British:	
Ayrshire	84, 169, 205, 214
Devon	75, 80, 205
Galloway	80, 150, 195, 205, 214, 222
Guernsey	80, 127
Hereford	76, 80, 162, 177–179, 184, 185
Highland	76, 80, 90, 214, 222
Jersey	75, 76, 80, 168, 201, 205
Kerry	80
Longhorn	80, 190, 199, 205
Polled Angus	75, 76, 80, 166, 193, 194, 201, 205, 209, 210, 214, 222, 538, 551
Red Polled	75, 80, 164, 205
Shetland	80
Shorthorn	73, 75, 76, 80, 158, 205, 214
In 1810	199
Sussex	75, 76, 80, 160, 205
Welsh	80, 166, 205
Cape Colony	670
Dutch	505, 516
Ecuadorian	635
French	250, 273, 275, 276, 277, 278, 284, 286
German	396, 402, 407, 434, 442, 448, 453, 468, 470, 471, 478, 480, 482, 487, 488
Honduranian	660
Imported, in the British markets	5
Hungarian	530

Prices of cattle—Continued. Page.
Italian 325, 328, 329, 331, 334, 355, 364, 365
Mexican 580, 595, 652
New Zealand 645, 647, 649
Ontario 559, 562, 570
Sierra Leonese 671
Spanish 388
Swiss 288, 290, 292, 299, 300, 302, 303, 305
United States 645
Venezuelan 638
Yang-tse-Kiang 666
Prices, cheese, imported in the United Kingdom 20
Cheese, Swiss 685
Prices, food, cattle:
In England 43–52
Tuscany 330
Prices, meats, imported:
In England 8, 12, 14
France 262
Mexico 579
Stuttgart 436
Prices, milk in New Zealand 574, 575
Pridgen, B. J., vice-consul at Piedras Negras:
Report: Breeding cattle of Northern Mexico 594
Prince Edward Island:
(Cattle in; Jersey *vs.* native cattle; weight of cattle; butter yield, 574; special statistics of cattle, topography, housing, feeding, &c., 575.)
Prince, Frederick W., consul at Belleville:
Report: Cheese-dairying in Hastings County, Ontario 506, 568
(Cattle and their import and export, 566; cheese-making; special statistics; yield, weight, and characteristics of cattle, 567; topography, housing, feeding, &c., 568.)
Pringle, R. O., on Kerry cattle 131
Prize breeders, British 712
Prize cattle:
British 58, 59, 60–62, 65, 88, 90, 105, 137, 139, 141, 145, 184, 186, 189, 196, 199, 712–715, 735–742
British *vs.* ordinary stock 67
French 240, 729–734
German 412, 420, 468
New Zealand 647
Product of cattle. (*See* Special statistics.)
Prussia:
Cattle in 408
Census of cattle 390, 399
Prize cattle of 412
Publications concerning cattle 66, 67, 86, 120
Purchasing cattle, when, where, and how:
British 170, 182, 205, 214
French 264
German 454, 482
Italian 333, 335
Swiss 288, 290, 302
Pyrennean cattle 257
Quarantine, cattle, regulations 643
Quibano cattle 631
Quebec, Province:
Best dairy cattle for; climate; native cattle; fodder 571
Breeds most suitable for 572
Housing and feeding in 574
Jerseys *vs.* native cattle, comparison 572
Special cattle statistics of 573
Topography, soil, grasses, &c 574
Ranges. (*See* Grazing.)
Ravensburg, Germany, cattle-breeding at 452
Rawics, Joseph, consul at Warsaw:
Report: Polish cattle 525, 526

Page.

Red Polled cattle:
- Characteristics 61, 71, 87, 162, 163, 196
- Breeding and handling 71, 92
- Crosses 91
- Milking qualities 61, 71
- Milk yield 88, 89, 90, 91, 163, 171
- Origin and history 61, 71, 86, 162
- Prices 75, 80, 164, 205
- Weight 61, 71, 74, 87, 92, 139, 164, 171, 180, 196, 206
- Yield, milk, butter, and cream 90

Renouf, Thomas, consular agent at Jersey:
- Report on Jersey cattle 205, 207

Rhine Province:
- Breeds of cattle in (Brirkenfeld, Westerwald, and Eifel) 487, 488
- Cattle market of Neuss 488
- Census of cattle 487
- Characteristics of cattle 489
- Housing and feeding 488
- Shipment to the United States 488
- Special statistics of cattle of; topography 489

Richards, John, on Welsh cattle 155

Rio de Janeiro 631, 632
- (Beef and dairy produce consumed in; municipal cattle tax; price of meat, &c.)

Risdon, T. H. on Somerset Devons 70

Robbins, R. B., commercial agent at Ottawa:
- First report: The most suitable cattle for Canadian farmers 538, 540
  (Shorthorns and Herefords, 538; native Canadian cattle, 539, 540.)
- Second report: Cattle in Carlton County, Ontario 568, 569
  (Topography, soil, average production, 568; altitude; special statistics: yield, weight, origin, and products of cattle, 569.)

Robertson, James, on Kerry cattle 130

Rqbeson, John T., consul at Beirut:
- Report: Cattle in Syria 652–654
  (Breeds and breeding cattle in Syria, 652; meat, milk, and cheese; export of cattle to the United States; Syrian sheep suitable for the United States, 653; special statistics: breeds, habitat, yield, weight, and characteristics of cattle; feeding and caring; topography, climate, 654.)

Roosevelt, George W., consul at Bordeaux:
- Report: Cattle-raising in the southwest of France 272–281
  (Origin of breeds, 272; description and general considerations, 272, 273; Bazadaise cattle, 274–276; Bordelais cattle, 276; experimental cattle-feeding; Landais cattle, 277; Limousine cattle; how to export cattle to the United States, 278; French breeds suitable for export to the United States; export of American cattle to Bordeaux, 279; cost of introducing, stabling, and feeding cattle in Bordeaux; cattle census of district, 281.

Rottweil, cattle-breeding at 458

Rovigo, province of:
- Cattle and cattle-breeding in 352
- Butter and cheese making in 353
- Description of province 351
- Climate 356
- Grasses 358
- Soil and substratum 357

Rowe, Joel, on cattle in Cornwall 207

Russia:
- Area and population 521
- Breeds of cattle in:
  - Angeln 524
  - Ayrshire 525
  - Cholmogorian 519, 524
  - Oldenburg 524
  - Polish 525, 526
  - Russian (common) 519, 520
- Census of live stock 521, 522
- Meat product from cattle 520
- Milking qualities of cattle 519

Russia—Continued. Page.
Provincial characteristics of Russia 521–523
Weights of cattle 523
Ryder, Henry B., consul at Copenhagen:
First report: Danish cattle 490–492
(Red Danish and Black-spotted cattle, 490; cattle census of Denmark; exports of Danish cattle; Danish cattle for the United States; special statistics of Danish cattle, 491; characteristics of cattle and topography of Denmark, 492.)
Second report: The Angeln cattle of Denmark 492–495
(Grazing grounds, 492; origin of breed, 492; breeding Angeln cattle, 493, 494; weight, milk yield, &c, 494, 495.)
Third report: Butter export of Denmark 495–498
Fourth report: Union dairies in Denmark 498–501
Fifth report: British cattle markets 696–699
Saint Gothard Tunnel, cattle transported via 453
Saint Thomas, island of 640, 641
(Census of cattle and imports of; imports of meat from the United States; butter and cheese imports; Danish *vs.* American butter.)
Saladeros (slaughter houses) in Uruguay 623
Salers cattle:
Characteristics and weight of 250, 727
Cross-breeds 253
Milk and work 727
Sales. (*See* Cattle sales.)
San Domingo 639, 640
(Cattle products, housing, feeding, temperature, &c.)
Sandringham herd 68, 710
Sarmiento's, Ex-President, description of the Gaucho herder of the Argentine Republic 613
Saunders, Joseph, on Berkshire pigs 789
Saunders, R. E., Yorkshire, on Highland cattle 146
Saxony:
Area under cultivation 427
Beehives in 431
Bulls, breeds and number of, kept for breeding purposes 427
Census of live animals 428–431
Scheuch, Frederick H., consul at Barcelona:
Report: Cattle in Catalonia 387, 388
Schleswig-Holstein:
Cattle and dairy products 410
Milk yield and weight of cattle 411, 412
Soil, climate, feeding, housing, &c 411
Schoenle, Wolfgang, consul at Barmen:
Report: Cattle in Germany 397–403
(Herd-books on cattle-breeding, 397; cattle-breeding and the several breeds in Germany, 398; cattle census of Germany, 399; cattle census of Europe, climate of Barmen, and cattle slaughtering in Germany, 400; Elberfeld abattoir, 401; prices of cattle, and cattle insurance companies, 402; importation of American beef-cattle into Germany, 403.)
Schoffer, Oeconomierath, president of the Kirchberg Ackerbauschule, on cattle-breeding at Kirchberg 452
Schools, agriculture:
At Hohenheim 448–450
Ontario 561
School, Munster dairy 48
Schwab Hall cattle:
Characteristics, weight, butcher, and draft 302
Price of 396
Schwitzer cattle:
Characteristics 292, 301, 395
Feeding and management 301
In European countries 302
United States 302
Milk yield 291, 292, 298, 306
Offshoots of 305
Origin 287, 394
Prices of 292, 299, 300, 302, 396
Weight, size, &c 306, 395

Page.

Scotland:
Altitude 217
Best cattle for export 214, 217
Breeding Scotch cattle 216, 221, 223
Breeds of cattle in:
Ayrshire 66, 76, 134, 168, 191, 211, 217, 220
Galloway 62, 147, 194, 210, 218, 219
Highland 63, 146, 196, 212, 218
Polled Angus 62, 76, 139, 184, 193, 209, 218
Shetland 142
Shorthorn 213
Butter and cheese yield in 212, 216, 219
Census of cattle 80, 214, 223
Characteristics; typical Ayrshire 220
Characteristics; typical Galloway 219
Climate 197, 217
Distribution of cattle in 222
Feeding cattle in 216, 221
Grasses cultivated in 217
Handling cattle-products in 216, 221
Housing cattle in 211, 216, 220
Imports and exports of cattle and meats 215
Land rents in 209
Milk yield of cattle in 212, 213, 216, 219
Origin of cattle 63, 86, 134, 139, 149, 193, 212, 216, 219
Prices of cattle in 210, 214, 222
Soil of 217, 222
Special statistics of cattle of 216, 219
Temperature of 217, 221
Topography 217, 221, 223
Transportation to the United States 213, 214
Yield (money) from cattle farming in 209
Weight of cattle in 209, 210, 211, 216, 219
Scott, Louis H., consul at Chihuahua:
Report: Cattle breeding in Chihuahua 585–587
Seychelles Islands, cattle statistics, topography, &c 673
Seymour, Charles, consul at Canton:
Report: Cattle in Southern China 668
Shaw, Albert D., consul at Manchester 78
(Transmitting a series of reports written by James Long, of Hetchin, England.)
Sheep and mutton in the United Kingdom 782–788
Sheep, breeds of, in the United Kingdom, and special statistics of:
Blackfaced Suffolk 787
Cheviots 758, 787
Cotswolds 755, 784
Devon Longwools 785
Dorset Horns 758, 785
Exmoor 759
Hampton Downs 786
Hardwick 759
Kentish or Romney Marsh 756, 785
Lanks 759
Leicesters 756, 783
Lincolns 756, 783, 784
Mountain 759
Oxfordshire 787, 786
Roscommon 757
Southdown 756, 783, 785
Suffolk Downs 758
Wicklow and Kerry 759
Wiltshire 757
Yorkshire 784
Sheep census of New Zealand 643
Sheep census of Nuevo Leon 590
Sheep farming in Nuevo Leon 590

Page.
Sheep farming in England (Southdown) 763–777
(History of Southdown sheep, 763–766; the Merton flock, 766; how to form a flock; breeding; practice at Merton, 767; feeding; management of flock, 768; how to avert abortion; lambing, 769; straining in ewes after lambing, 770; discussion on sheep breeding, 771; Southdown sheep and Cambridgeshire farming, 773–777.)
Sheep, French 777
Sheep in Bucks, England 711
Sheep, portraits of British 788, 789
Sheep, Syrian, suitable for the United States 653
Sheep *vs.* cattle in the Argentine Republic 612
Sheep, weights of, at Islington 778–782
Shepard, Isaac F., consul at Hankow:
Report: Cattle in the Yang-tse-Kiang Valley 664–668
(Topography of the valley, 664; soil, substratum, grasses, and breeds of cattle, 665; the water buffalo of the Yang-tse; methods of housing, 666; breeding; cattle census; exports of cattle to the United States, 667.)
Shetland cattle:
Description of, and habitat 142
Shorthorn cattle. (*See also* Bulls and Cows.)
Abbey farm herd, description, &c 72
Bred in the United States larger than the English 218
Characteristics 59, 60, 99, 157
Cow in Yorkshire, milch, description of 157
Cross-breeds 70, 100
Dairy 102
Herds, how to farm 101
Wonderful record 103
Denchfield stock 73
Duffryn herd, history and statistics of 69
In Colombia 633
Ireland 226, 228
New Zealand 646
Ontario 539, 542, 547, 553, 555, 556, 558, 561
Scotland 218
Letting out cows to laborers 107
Milking qualities 70, 188
Milk and butter yield 75, 103, 107, 157, 171, 190, 202, 216, 227, 228
Origin and history 59, 98, 210, 366
Prices 72, 75, 76, 80, 158, 190, 205, 214
Remarkable herd of, in Yorkshire 105
Treatment of, on a model farm 105
Valuable properties of 100
Weight and size 59, 70, 74, 103, 158, 171, 180, 190, 202, 205, 216
Yield in products, general 104
Shows. (*See* Cattle shows.)
Siam water buffalo, habits and uses of 660
Sierra Leone, cattle statistics of 671
Siler, James W., consul at Cape Town:
Report: Cattle in Cape Colony 669, 670
(The Africander cattle, characteristics, uses, weight, milk yield, &c., 669, 670; imported cattle, cattle census, value of cattle, imports of dairy products, 670.)
Silesia:
Area, climate, soil, topography, grasses 432
Cattle fairs, imports and exports of cattle 434
Characteristics of cattle 435
Feeding, housing, dairy farming 433
Imported and favorite breeds in 436
Products of Dutch cows in, census of cattle 437
Simcoe district, Ontario, cattle statistics of 570
Simmenthal cattle:
Beef cattle 290
Characteristics 289, 391, 445
Cross with Shorthorn 291
Milkers 289, 446
Offshoots 305

Simmenthal cattle—Continued. Page.
Origin 287, 291, 444
Price 290, 396
Suitable for export to United States 291
Weight 291, 304, 391, 445
Simpson, Thomas, consul at Puerto Plata:
Report: Cattle in San Domingo 639, 640
(Origin of cattle, deterioration of imported cattle, draft cattle, &c., 639; milk yield, weight of cattle, and yield of meat, climate, &c., 640.)
Singhalese cattle 656, 657
(Origin, height, weight, milk yield, draft cattle, characteristics, branding for sickness, &c.)
Size of cattle. (*See* Weight.)
Sizing cattle in Thuringia 439
Slaght, Harry L., consul at Prescott:
Report: Cattle in Prescott, Ontario 564–566
(Characteristics of the various breeds, 564; distillery-fed cattle for export to England; transportation to the United States, 565; general statistics, yield, weight, characteristics, origin, product, topography, housing, breeding, &c.)
Slaughter-houses. (*See also* Abattoir.)
In Argentine Republic 613
Uruguay (Saladeros) 623
Slaughtering cattle:
In Argentine Republic 614, 615
Germany 400
Honduras 598
Switzerland 295
Uruguay 623
Smithfield Cattle Show:
Weight of cattle at, 1883, various 180
Weight of Polled Angus at 105
Smith, C. & Son, on Guernsey cattle 125
Smith, Edward M., consul at Mannheim:
Report: Cattle products in Baden 473–475
(Breeds and characteristics, 473; statistics regarding the cattle of Baden, 474.)
Smith, J. A., on black Suffolk pigs 790
Smith, James Henry, commercial agent at Mayence:
Report: Cattle in the Grand Duchy of Hesse-Darmstadt 483–487
(Description of duchy, 483; climate, 484; cattle in duchy, 485; cattle statistics of duchy, 486; milk, butter, and cheese yield, 487.)
Smith, Jonathan, Jersey, on origin and improvement of Jersey cattle 117
Smith, Stephen H., consul at New Laredo:
Report: Cattle-raising in the state of Tamaulipas 592–594
(Tamaulipas cattle range, effects of drought on cattle-raising, 592; milk, butter, and cheese, grasses, cattle exports, &c., 593.)
Smith, V. V., consul at Saint Thomas, West Indies:
Report: Cattle and cattle products in Saint Thomas 640, 641
(Imports of cattle; meat imports from the United States; butter and cheese imports, 640; Danish *vs.* American butter in, 641.)
Soil and substratum:
Brazil 632
Denmark 492
France 269, 271
Germany:
Baden 464, 468
Bavaria 476
Brunswick 482
East Frisia 408
Odenwald 471
Oldenburg 413
Schleswig-Holstein 411
Silesia 432
Wurtemberg 455
Holland 513
Honduras 597
Hungary 588

Soil and substratum—Continued. Page.
Italy:
Piedmont ... 329
Terra di Lavoro ... 328
Tuscany ... 334
Venetia ... 357
Mexico ... 583, 592
Morocco ... 672
New Zealand ... 650
Ontario ... 554, 558, 564, 566, 568, 570
Prince Edward Island ... 575
Quebec ... 574
Russia ... 521, 522, 524
Seychelles ... 674
Sierra Leone ... 671
Switzerland ... 328
Syria ... 654
United Kingdom:
England:
Devonshire ... 160, 171
Herefordshire ... 163, 171, 191
Jersey ... 171
Norfolk ... 171, 190
Suffolk ... 164, 171
Sussex ... 161, 171, 198
Yorkshire ... 158, 171
Great Britain ... 171
Ireland ... 228, 235
Scotland ... 166, 171, 195, 217, 222
Wales ... 166, 171, 198
Yang-tse-Kiang Valley ... 665
Soiling system of feeding cattle ... 701, 703
Sonora. (*See* Mexico.)
Spackman, Samuel, consul at Cologne:
Report: Cattle in the Rhine Province ... 487, 489
(Cattle census of: Birkenfeld and Westerwald breeds, 487; Eifel breed; housing and feeding, cattle market of Neuss, shipment of cattle to the United States, 488; special statistics of cattle, topography of province, characteristics of the several breeds in, 489.)
Spain. (*See also* Andalusia, Catalonia, and Galicia.)
Cattle census of ... 14, 400
Special statistics of cattle:
(Under this head are embraced the tabulated statements from the several consulates, covering, in condensed form, names of breeds; milk, butter and cheese yields; habitat; weight; age at maturity; how long bred pure; products; housing; feeding, &c.)
Belgium ... 365
Brazil ... 632
Denmark ... 491, 492
Ecuador ... 635
France ... 265
Germany:
Baden ... 472, 474
Bavaria ... 478–480
Brunswick ... 482
Harz Mountains ... 483
Marshes ... 424
Oldenburg ... 409
Prussia ... 412
Rhine Province ... 489
Schleswig-Holstein ... 411
Silesia ... 435–437
Thuringia ... 442
Wurtemberg ... 463, 464
Holland ... 512–514
Hungary ... 535–536

Special statistics of cattle—Continued. Page.
Italy:
Piedmont ... 329
Terra di Lavoro (buffalo cattle) ... 328
Tuscany ... 333
Venetia ... 355–358
Morocco ... 672
New Zealand ... 650
Ontario ... 553–555, 558, 563, 566, 566, 567, 569, 570
Prince Edward Island ... 575
Quebec ... 573
Russia ... 524, 525
San Domingo ... 640
Seychelles ... 674
Spain (Western Andalusia) ... 336, 337
Switzerland ... 297, 322
Syria ... 654
United Kingdom ... 171, 172
Ireland ... 227, 228
Scotland ... 216, 219
Spencer, O. M., consul-general at Melbourne:
Report: Cattle in Victoria ... 651
Spencer, Sanders, on Yorkshire pigs ... 789, 790
Stanton, Edgar, consul-general at St. Petersburg:
Report: Cattle-breeding in Russia ... 519–524
(Breeds in Russia, and milking qualities of, 519; weight and milk and meat product of cattle, 520; area and population of the Russian Empire, provincial characteristics of Russia, 521–523; pictures of Russian cattle, 523.)
State aid and encouragement to:
Cattle breeding:
Belgium ... 54
England ... 58
Hungary ... 528
Ontario ... 560
Switzerland ... 303
Fresh-meat export: Uruguay ... 626
Stephenson, Clement, on Polled Angus cattle ... 139
Sterne, Henry, consul at Buda-Pesth:
Report: Meat and dairy cattle in Hungary ... 527–536
(Cattle-raising in Hungary; meat and work cattle; cross-breeds for dairying, 527; State encouragement of cattle-breeding, the White cattle of Hungary, 528; price of White cattle, Buffalo cattle, 530; housing, feeding and breeding in Hungary, butter and cheese-making in Hungary, 531; cattle census and imports of Hungary, 532; imports of canned beef from the United States, exports of Hungarian meats and cattle, healthiness of Hungarian cattle, 533; transportation to the United States, outlook for cattle-breeding in Hungary, 534; special statistics of, concerning Hungarian cattle, 535; climate, soil, topography, weights, &c., 536.)
Steuart, John H., consul at Antwerp:
Report: Cattle in Belgium ... 359, 360
(General information concerning Belgian cattle, 359; transportation to the United States, 360.)
Stewart, Robert, Stirling, on Highland cattle ... 147
Stone, Frederick W., Guelph, Ontario, on Hereford cattle ... 556
Stock-raising in Mexico ... 589
Ranges and herders in Honduras ... 599
Stratton, R., on Duffryn Shorthorns ... 69
Studer, A. G., consul at Singapore:
Report: The water buffalo of Siam and Malaysia ... 660, 661
Stuttgart, prices of meat in ... 456
Suffolk:
Cattle, milk yield ... 739
Topography, soil, climate, &c ... 164, 171
Sumatra, cattle plague in ... 662
Surridge, Mr., on Devon cattle ... 110

Sussex cattle: Page.
Characteristics 61, 72, 114–116
Housing and feeding 115
Milk, butter, and cheese yield 72, 114, 160, 198
Origin of 72
Price of 75, 76, 80, 160, 205
Value, as meat cattle 115
Weight of 62, 74, 115, 160, 180, 198
Working, manner of 116
Sussex:
Guernsey cattle in: Report of breeder 126
Topography, soil, climate, &c 160, 161, 198
Sutton, Warner P., consul-general at Matamoros:
Report: Cattle breeding in Northern Mexico 576–585
(Origin, breeds, uses, milk, butter, and cheese, 576; variations of breeds, colors, grasses and other food, water and water-tanks, 577; imports of improved stock, 577; methods of breeding, 578; value of Mexican cattle for the United States, 580; exports of cattle to, and imports of cattle products from the United States, 581; Mexican duties, cattle census, 582; diseases, weight, and measure of cattle; soil of Northern Mexico, 583; climate, elevations, &c., 584; illustrations and acknowledgments, 585.)
Swinburne, John, on Highland cattle 146
Swine. (*See* Hogs.)
Swiss cattle:
In Italy 324
United States 288, 318
System of slaughtering cattle 295
Switzerland:
American butter, cheese, and meats in 321
Breeds of cattle in:
Appenzell 307
Black-spotted Freiburg 291
Brown Schwitzer 287, 291, 298, 306
Cross-breeds 291
Einsedeln 307
Miscellaneous 305
Mountain 307
Simmenthal 287, 289, 293, 297, 304
Butter-making in 314, 315
Cantonal prize shows 307
Census of cattle 10, 400, 321
Characteristics of cattle 307, 322
Cheese-making in 315, 682, 684
Cheese, analysis, prices, and quality of 684
Condensed milk, manufacture in 312
Dairying on the High Alps 311
Exports of:
Butter 315
Cattle 287, 288
Cheese 317, 684
Condensed milk 312
Feeding cattle in 296, 299, 300, 301, 323
Grasses, cultivated 323
Government assistance to cattle-breeders 307
Grazing cattle on the Alps 310
Housing and caring for cattle 293, 308, 309, 310, 323
Imports of:
Butter 315
Cattle 287, 321
Cheese 684
Meat product of cattle 295
Milk-care establishments 312
Milking qualities of cows 292, 298
Milk yield of cows 297, 299, 306, 319, 322
Percentage of cattle-breeds in 318
Prices of cattle in 288, 290, 292, 299, 300, 302, 303, 305
Purity of milk 312

	Page.
Switzerland—Continued.	
Results of breeding from imported stock	321
Special statistics of cattle	297, 322
Soil and substratum	323
System of slaughtering cattle in	295
Transportation of cattle to the United States	288, 296, 303
Weight and measurement of cattle	293, 297, 304, 306, 322
Working qualities of cattle	297
Syria:	
Breeding and raising cattle in	652
Breeds of cattle in (Joulany, Belady, and Haysy)	652
Meat, milk, and cheese in	653
Sheep of, suitable for the United States	653
Special statistics of cattle, topography, soil, climate, &c	654
Transportation of cattle to the United States	653
Tallow exports from the United States	21, 39
Tamaulipas. (*See* Mexico.)	
Tanner, George C., consul at Verviers and Liege:	
First report: Cattle-breeding in Europe and in the United States	41–56
(General information, 41; care of cattle in Europe and in the United States, 42; cost of producing fine cattle in England, 43; caution to Galloway breeders, 45; feeding stuffs, 46; experiments in fattening steers, 47; feeding cattle on turnips, food of pregnant animals, feeding dairy cows at the Munster Dairy School, 48; fattening American cattle in England, exercise for cows, 49; cattle shows in England, 50, 54–56; how cattle degenerate, early imports of blooded cattle into the United States, American farmers at fault, 51; American craze for English cattle, 52; Government encouragement of European cattle-breeding, 53.)	
Second report: Cattle and cattle breeding in Belgium	366–370
(Belgian cattle breeds, assumed origin of the Shorthorn, 366; cattle census of Belgium; favorite breeds; the Hollandais, 367; the Flemish cow; the Flechet breed; imports of butter into Belgium, 368; imports of meat and meat cattle into Belgium, counterfeiting American products, 369; American products for Belgium, 370; preservation of meats and vegetables fresh, 370, 699–701.)	
Tarentaise cattle (mountain cattle)	728
Taylor, Alfred, Norfolk, on Red Polls	70
Taxation and export duties, cattle	580, 599
Taxes, octroi, in France (cattle)	260
Tax on cattle in Rio de Janeiro	632
Tests (*see also* Trials):	
At the Agricultural College and Model Farm, Ontario (milk yields of several breeds.)	561
London dairy	202, 720
Milk and cream in England	89
Tethering cattle in Jersey	117
The Times, London, on "American Craze for English Cattle"	52
Thomas, Richard, on Welsh cattle	155
Thompson, A. J., shipper of Canadian cattle to England	6
Thuringia and its people	438
Butter and cheese; breeding from imported cattle; distribution of cattle; population	441
Characteristics of cattle (Allgauer, Heilbronner, Glau)	438, 439, 442
Housing, feeding, breeding, &c	440, 442
Sizing cattle in; cows as draught animals	439
Special statistics: milk yield, weight, price	442
Topography, climate, soil, &c	442
Tillage lands of Oldenburg	414
Tondern cattle:	
Characteristics	395
Milk yield	410
Weight	410, 411
Topography of:	
Brazil	632
Ceylon	659
Denmark	402
France	269, 271
Germany	425
Baden	474
Bavaria	475

Topography of—Continued. Page.
Germany—Continued.
Brunswick ... 482
Rhine province ... 489
Silesia ... 432
Thuringia ... 442
Honduras ... 597
Holland ... 513
Hungary ... 536
Italy:
Piedmont ... 329
Terra di Lavoro ... 328
Tuscany ... 333
Venetia ... 356
Mexico ... 584, 586, 587, 592
Morocco ... 672
Ontario ... 554, 558, 564, 566, 568, 570
Prince Edward Island ... 575
Quebec, province of ... 574
Russia: Baltic provinces and Finland ... 524, 525
Seychelles ... 674
Sierra Leone ... 672
Spain, Cadiz ... 385
Syria ... 654
United Kingdom:
England:
Cornwall ... 207
Devonshire ... 160
Herefordshire ... 162
Jersey ... 168, 206
Norfolk ... 164
Sussex ... 160
Scotland ... 169, 217, 221
Wales, Anglesea ... 166
Yang-tse-Kiang Valley ... 604
Transportation of cattle to the United States (routes, cost, feed, attendance, &c.):
From Belgium ... 380, 382
Denmark ... 491
France, from Bordeaux ... 278
Germany:
East Friesland and Oldenburg ... 419
Frankfort-on-the-Main and Hesse-Nassau ... 396
Harz Mountains ... 483
Rhine Province ... 488
Silesia ... 434
Holland ... 506, 516
Hungary ... 534
Italy:
Genoa to New York ... 325
Leghorn to New York ... 332, 335
Naples to New York ... 328
Venice to New York ... 355
Mexico (driving) ... 581, 588
New Zealand ... 645, 649
Ontario ... 543, 557, 565, 570
Russia ... 524
Spain ... 388
Switzerland ... 288, 296, 303, 319
Syria ... 653
United Kingdom ... 169, 694–696
England:
Bristol (Hereford) ... 178
Liverpool ... 169, 205, 694
London ... 77
Ireland ... 227
Scotland ... 213, 214, 222
Yang-tse-Kiang Valley ... 667

Page.

Treadwell, John, Eylesbury, on sheep and cattle in Bucks 711
Treatment:
Of Ayrshire cattle 168
Jersey calves, in Jersey 110
Shorthorns on a model farm 105
Treviso, province of, cattle in 338
Trials (*see also* Tests):
Milk:
In England, Red Polled cows 89
various breeds 104
Holstein, model farm 412
Ontario agricultural school 561
Saxony, Frisian, Schleswig, and Silesian cows, five years' trial 412
Triesdorf cattle (erroneously spelled Friesdorf on page 392):
Origin, characteristics, milk yield, &c 392
Price 396
Tuscany:
Chianina breed: weight, price, feeding and housing, 331; characteristics, 332, 334.
Maremmana cattle in 332
Milk, butter, and cheese yield of cows 333
Svizzera cattle in 332
Topography, temperature, soil, &c 333, 334
Transportation to the United States, cost 333, 333
Weight of Chianina cattle 334
Tyssen, Amherst, Mr., M. P., weights and measures of Red Polls 92
Udine, province of:
Cattle of 337
Climate of 356
Grasses 358
Herding and dairying in 337
Improving cattle in 338
Mountain and pasture lands 336
Soil and substratum 357
Union dairies in Denmark 498
United Kingdom:
Breeds of cattle in:
Ayrshire 63, 134, 168, 199, 211, 220, 740
Devon 57, 107, 158, 191, 739
Dexter 228
Galloway 62, 147, 149, 194, 210, 218, 219
Guernsey 64, 124
Hereford 58, 110, 161, 172, 181, 190, 739
Highland 63, 143, 196, 212, 218
Jersey 64, 116, 166, 200, 205, 741
Kerry 65, 129, 226
Limerick dairy 228
Longhorn 60, 94, 199, 739
Polled Angus 62, 139, 164, 193, 209, 218
Red Polled 61, 86, 162, 196
Shetland 142
Shorthorn 59, 98, 157, 188, 213, 735
Suffolk 739
Sussex 61, 114, 160, 197, 740
Welsh 65, 153, 166, 198, 742
Breeders of prize cattle in 712
British cattle and cattle imports 79–81
British cattle markets 696
Cattle shows in 50, 54
Census of cattle in 10, 80
Central Chamber of Agriculture 722
Cost of producing fine cattle in 43–48
Herds, noted in:
Abbey Farm Shorthorn 72
Cotswold Shorthorn 74
Denchfield Shorthorn 73
Duffryn Shorthorn 69

United Kingdom—Continued. Page.
Herds, noted in—Continued.
Hutchinson Shorthorn ... 105
Lofft-Suffolk Red Polled ... 71
Lord Braybrook's Jersey ... 121
Morland Sussex ... 72
Sandringham (various) ... 68, 710
Shorthorn-Gwyn ... 70
Somerset Devon ... 70
Sussex Guernsey ... 126
Taylor's Red Polled ... 71
Fattening American cattle in ... 49
Geological character of ... 67
Hogs, breeds and breeding in ... 760
Imports into:
Butter and butterine ... 15, 32
Canned beef, American ... 21
Cheese ... 20, 36
Fresh beef ... 7, 29
Live cattle ... 5-7, 11, 26, 223
Oleomargarine ... 16
Preserved meats ... 12-14
Position of dairy farming in ... 716
Publications concerning cattle in ... 66
Sheep, breeds and care of (*see* Sheep) ... 762-780
United States:
Best cattle for import into:
Belgian ... 304
Brazilian ... 631
British ... 65, 80, 157, 169, 172, 188, 203, 204, 214
Dutch ... 505, 516
French ... 265, 279, 283, 285
German ... 418, 423, 434, 482, 487
Hungarian ... 528
Italian ... 325, 331, 334, 354
Mexican ... 580
New Zealand ... 64
Ontario ... 541, 548, 565
Russian ... 523, 524
Swiss ... 291, 293, 322
Syrian ... 653
Canadian cattle companies in, operations of ... 537
Care of cattle in, and in Europe, compared ... 42
Cattle breeding in, and in Europe ... 41
Census of cattle in ... 12
Condensed-milk factories in ... 313
Exhibition of Irish hermetically sealed butter in ... 229, 233
Exports from:
Beef, canned ... 4, 21, 22, 37
fresh ... 4, 8, 11, 13, 22, 28, 37
salted ... 4, 22, 37
tallow ... 4, 21, 22, 39
Butter ... 4, 16, 18, 22, 30, 39
Cattle ... 4, 22, 25, 37
Cheese ... 4, 20, 22, 34, 39
Condensed milk ... 4, 22
Meats, how to increase the ... 215
Oleomargarine ... 16, 19, 22, 39
First imports of blooded cattle into ... 51
Hereford cattle in, number exported to ... 179
Milk yield of cows in, as compared with Swiss cows ... 209
Purchasing foreign cattle for, best place, time, and way:
British cattle ... 170, 182, 205, 214
French cattle ... 264
German cattle ... 454, 482
Italian cattle ... 333, 335
Swiss cattle ... 288, 290, 302

United States—Continued. Page.
Transportation of cattle to the United States, routes, cost, feed, attendance, &c. (*See* Transportation.)
Treasury cattle commission on the healthiness of American cattle 644
Uri cattle, characteristics, milking qualities, &c 726
Uruguay:
Census of cattle 12
Climate 622
Export of beef 623
Frozen-meat trade 625–629
Liebeg's extract of beef factory in 624
Slaughter of cattle, statistics of 623
Value of lands and stock 623
Veal, French 284
Vegetables and meats preserved fresh, Belgian process 870, 699
Venetia:
(For particulars relating to each province in Venetia, *see* Belluno, Padua, Rovigo, Treviso, Udine, Venice, Verona, and Vicenza.)
Breeds of cattle in, and charactistics of 356
Climate and topography of 356
Geological formation of 335
Milk, butter, and cheese yield of cattle in 355
Special statistics of 355–358
Substratum and grasses 358
Weight and size of cattle 355
Venezuela:
(Area and population, interior communication, number of persons engaged in the cattle industry, character of cattle in, 637; rounding up cattle, pasturage, price of cattle, 638; Maracaibo cattle supply and demand, 638.)
Venice, district of:
Cattle in, and discription of district 353
Climate and topography 356
Substratum and cultivated grasses 358
Verona: Climate, soil, substratum, grasses 356–358
Vial, A., vice-consul at Nice:
Report on cattle in the district of Nice 286
Vicenza:
Butter and cheese making in 344
Climate of 356
Dairying in the lowlands 345
Grasses, cultivated 358
Mountain herding and dairying in 343
Mountain to lowland stock-raising 346
Soil and substratum 357
Topography and climate 343, 356
Viosca, James, consul at La Paz:
Report: Cattle in Lower California 696
Vogeler, Ferdinand, consul-general at Frankfort-on-the-Main:
Report: Breeds of cattle in Germany 389–397
(Cattle in Hesse-Nassau and Prussia, 389; origin of European cattle, 390; the Neckar, Simmenthaler, and Limbourg breeds, 391; the Triesdorf, Alb, Schwab Hall, and Dutch breeds, 392; the Montafoner, Miesbacher, and Pinzgauer breeds, 393; the Allgauer and Schwitzer breeds, 394; the Voightland, Angeler, and Podolisch breeds, 395; the Murzthaler breed, prices of German cattle, cattle exports to the United States, and improvement of cattle in Germany, 396.)
Vogelsberg cattle 485
Voight, Julius G., commercial agent at Manila:
Report: Cattle in the Philippine Islands 673
Voightland cattle:
Characteristics 395, 443
Origin 443
Price 396
Weight and size 443
Vossler, Professor, Hohenheim Agricultural School, on cattle and cattle-breeding in Wurtemberg 442

Page.
Wages of herders in France 253
Honduras 599
Switzerland 300
Wales:
Cattle census of 80
Welsh cattle (Runts, Black Cattle, &c.):
Characteristics of 65, 153, 155, 166, 198, 742
Docility of 154, 742
Fattening 742
Herd-book of 166
Milk, butter, and cheese yield 75, 154, 155, 166, 171, 198
Origin and history of 153, 742
Price of 80, 166, 205
Rearing calves 154
Testimony of noted breeders 155, 156
Weight of 74, 154, 155, 166, 198, 742
Yield of, as dairy cattle 154
Walker, Mr., on milk *vs.* butter yield of Jerseys, and rearing calves 118
Warner, William D., commercial agent at Dusseldorf:
Report: Cattle breeds in Germany 404–408
(Dutch and Semmenthal breeds, 404; Swiss, Montafoner, and Algau breeds, 405; fattening cattle in Germany, 406; statistics of ox fattening and prices of German cattle, 407.)
Water buffalo of Siam and Malaysia 600
Water supply for cattle in Mexico 577
Weald of Kent, cattle and sheep in 711
Weather reports, value of, to farmers 546
Webster, A. G., consul at Hobart:
Report: Cattle in Tasmania 650
Weights, size, and measurement of cattle (*See also* Special statistics):
Africander 670
American 81
Austrian 206
Belgian 365, 373
Brazilian 631, 632
British cattle:
Ayrshire 74, 138, 168, 171, 200, 216, 219, 525
Devon 72, 74, 109, 110, 160, 164, 171, 180, 192, 201, 203
Galloway 149, 151–153, 195, 211, 216, 219
Guernsey 125
Hereford 59, 72, 74, 114, 161, 162, 171, 173, 184, 191, 203
Highland 74, 145, 146, 189, 197, 216, 219
Jersey 74, 167, 171, 201, 206
Kerry 133, 227
Limerick dairy 227, 228
Longhorn 94, 97, 199
Polled Angus 61, 74, 87, 92, 165, 166, 171, 180, 194, 201, 203, 216, 218, 219
Red Polled 61, 71, 74, 87, 92, 189, 163, 171, 180, 196, 203, 204, 216, 219
Shorthorn 59, 70, 74, 103, 158, 171, 180, 190, 202, 203, 205, 216
Sussex 62, 74, 115, 160, 171, 180, 196, 203
Various breeds, daily increase 47, 723
Welsh 74, 154, 155, 166, 171, 198, 742
Danish 81, 491, 492, 494, 495, 524
Dutch 81, 393, 437, 512
Ecuadorian 685
French 81, 244, 248, 250, 255, 257, 265, 274, 276, 296
German 81, 391–395, 405, 406, 409–412, 424, 435, 437, 439, 442
Hungarian 535, 536
Italian 296, 327–329, 331, 333, 334, 355, 356, 365, 373
Japanese 663
Malaysian (buffalo) 661
Mexican 583
New Zealand 650
Ontario 81, 553, 554, 558, 561, 564, 566, 567, 569, 570
Portuguese 81

Weight, size, and measurement of cattle—Continued. Page.
Prince Edward Island 575
Quebec 574
Russian 520, 524, 525
San Domingo 640
Singhalese 656
South African (Cape Colony) 670
Spanish 81, 386
Swedish and Norwegian 81
Swiss 291, 296, 297, 304, 306, 307, 322, 323
Yang-tse-Kiang Valley 665
Wells, Willard S., consul at Dundee:
Report on cattle in Scotland 208–217
(Introductory, 208; Polled Angus, 209; Polled Galloways, 210; Ayrshires as dairy cattle, 211; Highland cattle, 212; Shorthorns in Scotland, offspring of imported cattle, best method of exportation to the United States, 213; best Scotch cattle to export, price of, and cattle statistics of Scotland, 214; imports and exports of meat and cattle, nature of import supplies, imports from the United States and best means of enlarging, 215; special cattle statistics for Scotland, 216; topography, climate, soil, &c., 217.)
Welsh cattle. (*See* Wales.)
Welsh, William L., consul at Florence:
Report: Cattle in Tuscany 330–334
(The Chianina breed, 330; cattle of the Val di Chiana, 331; transport of cattle to the United States; Maremmana cattle; Svizzera cattle, 332; purchasing Italian cattle; special cattle statistics, 333; topography, climate, soil, &c., 334.)
Westerwald cattle:
Characteristics, milk yield, weight 489
Prices of 487
White cattle of Hungary:
Characteristics 529, 535
Fattening qualities 530
Meat and labor qualities 529, 535
Milk yield 535
Origin 529
Price 530
Weight and size 535
White cattle of Tuscany. (*See* Chianina cattle.)
White, Mr., Wiltshire, on Hereford cattle 177
White, Mrs., Roussaillerie Farm, on Guernsey cattle 125
Wild cattle:
Of Mexico 579
the Pampas, Argentine Republic 604
Wilken, C., on Polled Angus cattle 141
Willard, A., consul at Guaymas:
Report: Cattle-raising in Sonora 595
(Breed; prices; exports to the United States; imports from the United States; Sonora as a cattle range.)
Wilson, John, consul at Brussels:
Report: Breeds of cattle in Belgium 360–365
(The Furnes-Ambacht, Ardennaise, Charleroi, and foreign and cross breeds in Belgium, 361; cattle-feeding, yield of milk of Belgian cows; miscellaneous statistics, and imports of cattle into Belgium, 363; prices of Belgian cattle; Belgian cattle for the United States, and export of American beef and cattle to Belgium, 364; weight and measurement of cattle and price of dressed beef, 365.)
Wilson, John M., consul at Bremen:
Report: Cattle in Oldenburg, Jeverland, and East Friesland 413–425
(Soil and climate, 413; tillage and grazing lands, 414; cattle and cattle-breeding in the Marshes, 415; superiority of Oldenburg cattle for export; product and export of Marsh cattle, 418; export of cattle to the United States; portraits of Oldenburg and East Frisian cattle, 419; housing, feeding, and breeding, 421; American cattle and hogs in Oldenburg; imports of meats and dairy products; percentage of breeds in the district; best cattle for export to the United States, 423; special statistics of Marsh cattle, 424; topography, soil, substratum, grasses, housing, feeding, &c., 425.)

Page.

Wilson, Thomas, consul at Ghent:
Report: Belgian and Dutch milch cows 370–383
(Dairy machinery; Belgian milch cows, 371; size and weight of Belgian cattle, 373; milking qualities of Belgian cows, 374; milk given by sixty English cows for twelve months, 375; milk given by Dutch and Flemish cattle and their crosses, 378–381; transportation of Belgian cattle to the United States; exportation of American horses to Belgium, 382; authorities and sources of information, 383.)
Wiltshire dairy record 691
Winter, John F., consul at Rotterdam:
Report: Cattle of Holland 515–518
(Different breeds in Holland, 515; price of Dutch cattle; cattle export and import of Holland; export of Dutch cattle to the United States, 516; census of Dutch cattle, 517, 518.)
Wood, Henry, on Southdown sheep, their history, breeding, &c 763
Worden, W. A., consul at Charlottetown:
Report: Cattle in Prince Edward Island 574, 575
(Cattle breeding, 574; breeds, yield, and weight of cattle; topography, housing, feeding, &c., 575.)
Working-cattle in:
Argentine Republic 602
Ceylon 656
England, Sussex 116
France 273, 282
Germany 392, 393, 480
Hungary 527
Italy 327, 328, 331–334, 340, 353, 354
Japan 663
Java 661
Malaysia 661, 662
Mexico 588
Morocco 672
New Zealand 648
Philippine Islands 673
South Africa (Cape Colony) 670
Switzerland 289, 297
Syria 652
Worthington, John, consul at Malta:
Report on cattle in Malta 323
Wurtemberg:
Cattle-breeding in 444–464
(Cattle census of, Simmenthaler breed, weight and food, 444; characteristics of Simmenthaler cattle, 445; Montafoner and Allgauer breeds, characteristics, &c., 446; Limburger and Neckar breeds, characteristics, &c., 447; prices and weight of cattle; cattle-breeding at Hohenheim, 448; stabling, feeding, and breeding, and bull-keeping at Kirchheim, 450; cattle-breeding at Rottweill, 451; cattle-breeding at Kirchberg and at Ravensburg, 452; cattle-breeding at Heidenheim, 453; cattle exhibition at Heilbronn; cattle transport via the St. Gothard tunnel, 453; cattle trade at Calw; cattle fairs in 1882; climate, 454; soil; distribution of area, 455, 463: meat supply of, 455; meat prices at Stuttgart, 456; dairy associations: at Aichstetten (456), at Allgau (457), at Heldenfingen (460); characteristics of Wurtemberg cattle, 464.)
Wyatt, Nevill, on Sussex Guernseys 126
Yorkshire, topography, soil, and climate 158
Youatt:
On Devon cattle 57
Longhorn cattle 94
Kerry cattle 130
Zanzibar, cattle in 672

O